MARCH · 1960

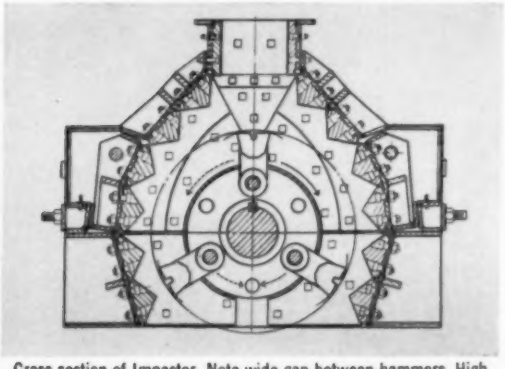
ROCK PRODUCTS

WILLIAMS REVERSIBLE IMPACTOR

Up to 250 tons of aggregate hourly with only 6 men!

Illustrated is Williams No. 445-X Reversible Impactor powered by 250-HP motor. Preceded by a 30 x 42 jaw crusher and apron feeder, and followed by gradation screens in closed circuit, up to 250 tons of aggregate per hour was obtained to meet these Tennessee Highway Dept. specs.:

100	Percent	1"	Passing
80-95	Percent	¾"	Passing
50-85	Percent	⅜"	Passing
36-65	Percent	No. 4	Passing
20-43	Percent	No. 16	Passing
10-21	Percent	No. 100	Passing



Cross section of Impactor. Note wide gap between hammers. High drop chute feeds rock between hammers so it is thrown against impact blocks to set up a ricochet action. Center impact blocks are adjustable with relation to hammers.

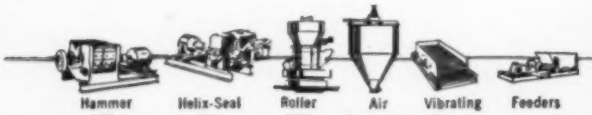
The beaming smile on Clarence Duke, co-owner of Burns Stone Company of Burns, Tennessee, indicates his complete satisfaction with the amazing output of his Williams Reversible Impactor. Hitting the Tennessee Highway Department's tightest aggregate specification right down the middle on the "fine" side, the Williams Impactor produced an average of 200 tons-per-hour, frequently reaching *250 tons hourly with only 5 men and Mr. Duke*. Performance was so gratifying he ordered another Impactor for the Burns Company plant at Cumberland Furnace, Tenn. Ben Ferguson, at right, is representative for Southern Machinery Company, Williams' distributor for middle Tennessee and north Alabama, which designed and furnished equipment for the Burns' plants.

HIGHER OUTPUT of BETTER PRODUCTS at LOWER COST

- **100% product sizing** is assured with a Williams Impactor
- **Lower upkeep expense.** No close clearances of impact hammers and blocks have to be maintained.
- **Reversible rotor** doubles life of wearing parts. Eliminates manual turning of hammers.
- **Completely open discharge** allows unrestricted flow of finished material. Closed circuit operation takes out crushed material as fast as made. No over-crushing or grinding.
- **Accessibility-plus!** Easiest of all crushers to service. Complete rotor removable without disturbing any feed mechanism.
- **Heavy steel plate frame**—forged steel oversize rotor shaft—extra heavy alloy steel hammers and impact blocks—many other exclusives insure longer, lower-cost operation.

Ask for brochure

WILLIAMS PATENT CRUSHER & PULVERIZER CO.
2706 North 9th Street **St. Louis 6, Mo.**



WILLIAMS
CRUSHERS GRINDERS SHREDDERS
Oldest and Largest Manufacturers of Hammer Mills in the World

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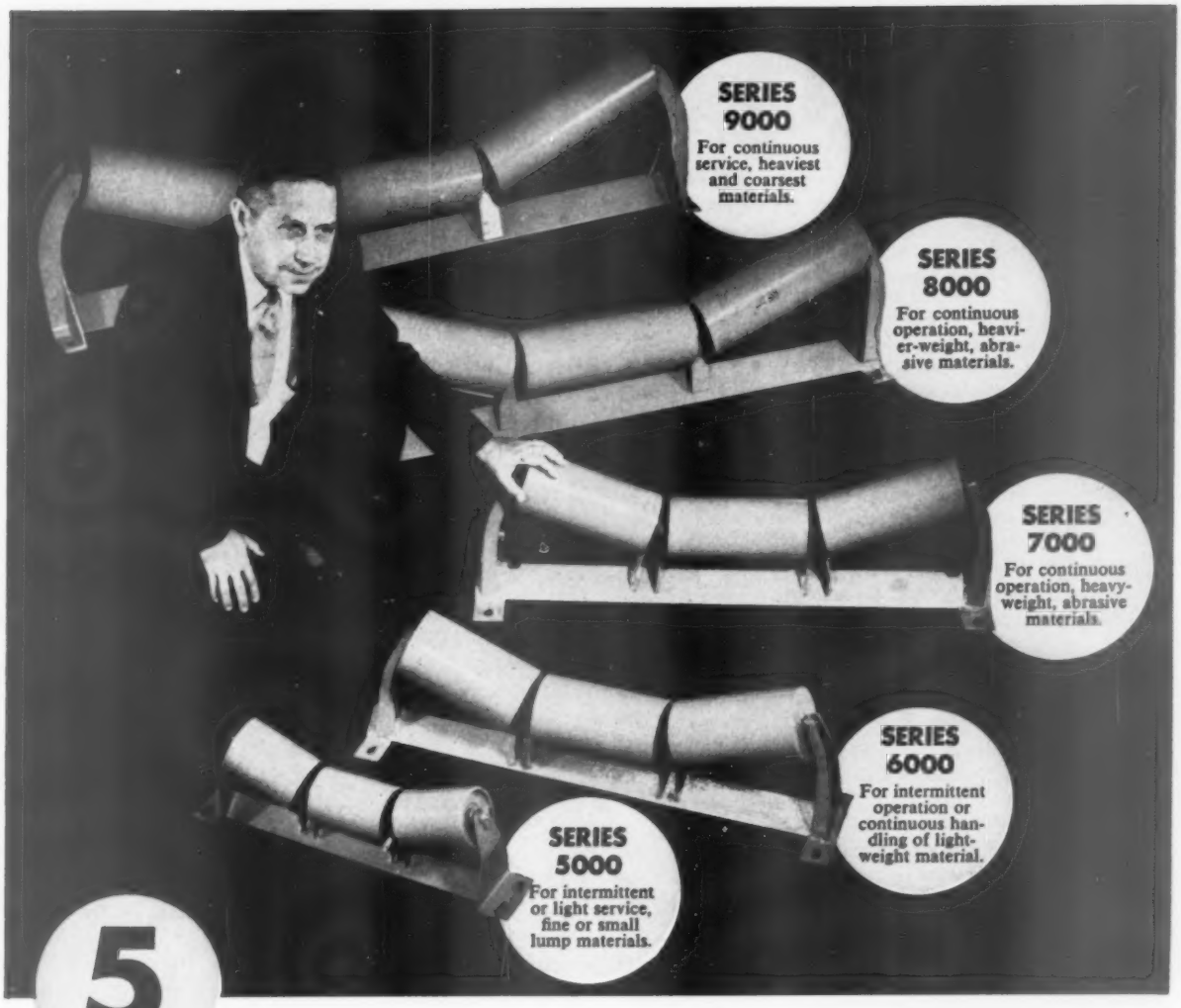

5

series of belt conveyor idlers

end wasteful over and under-engineering

LINK-BELT's complete line is your best insurance against high replacement and maintenance costs

Now, industry's broadest belt conveyor idler line becomes even broader! This permits even greater "pin-point" selection, resulting in substantial savings in purchasing and maintenance by avoiding wasteful over or under-engineering. Five series in 850 types range in application from light or intermittent service to continuous heavy-duty operation —from 20° up to 45° troughing for a broad range of belt widths—with rolls of various diameters, materials and coatings.

15,315

For further facts on this broad line—contact your Link-Belt office or authorized stock-carrying distributor. Look under CONVEYORS in the yellow pages of your phone book. Or write for new Catalog 2716.

LINK-BELT

BELT CONVEYOR IDLERS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.

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ROCK PRODUCTS

a Maclean-Hunter publication, Vol. 63, No. 3

March 1960

In this issue

Departments

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B.F.Goodrich

V belt briefs

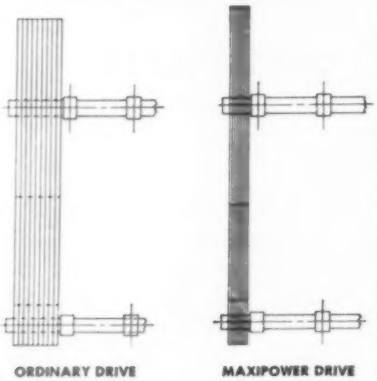
TIPS ON THE CARE, MAINTENANCE AND SELECTION OF V BELTS FOR INDUSTRY

ORDINARY V BELT DRIVE

MAXIPOWER DRIVE

SAVE $402.14 ON V BELT DRIVES—*Costs for* both *sheaves and V belts were cut when B.F. Goodrich Maxipower belts replaced ordinary belts on this drive. Size and weight of sheaves were reduced, smaller and fewer V belts were used*—eight *5V2500 belts replaced* nine *D-240 belts. The result: a $402.14 saving. Costs can be cut as much as 30% by switching to a Maxipower V belt drive.*

How Maxipower V belts reduced bearing load 42%

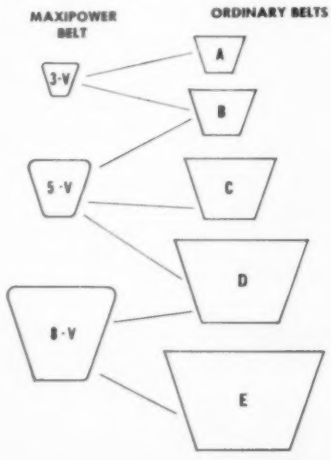


ORDINARY DRIVE MAXIPOWER DRIVE

In the installation shown above, sheaves for the Maxipower drive are lighter, have a face width of only 5 13/16", compared to a 13¼" width for the sheaves on the ordinary drive. Because there's less weight, less shaft overhang, bearing load for this Maxipower drive is 42% less for the driven shaft shown than the drive replaced. This greatly increases bearing life.

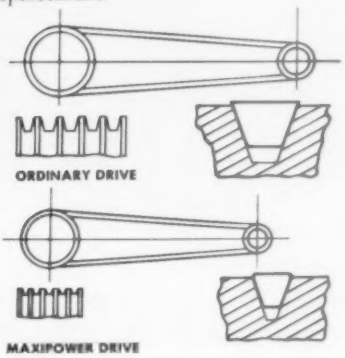
With Maxipower V belts, three cross sections do the work of five

Each cross section of the new B.F. Goodrich Maxipower V belts has been fitted to a particular horsepower range so that only three cross sections are needed instead of the A, B, C, D, and E sections of conventional V belts. The three cross sections are 3V, 5V and 8V.



New BFG Maxipower V belts save space, weight, bearings, dollars

New B.F.Goodrich Maxipower V belts give up to three times the horsepower-carrying capacity in the same amount of space as ordinary belts. This more compact drive gives you more horsepower per dollar, results in substantial savings, both in initial costs and often in belt replacement.



ORDINARY DRIVE

MAXIPOWER DRIVE

In most Maxipower installations, fewer belts and smaller diameter sheaves are used, center distances are shorter. Costs can be cut up to 30%, valuable space is saved. Sheaves have narrower grooves and groove spacing, are smaller, less costly. The smallest sheaves that can safely be used with the drive motor can be installed. Often these will be 50% smaller than present drives. This reduced sheave weight and face width means less shaft overhang, less bearing load—increased bearing life.

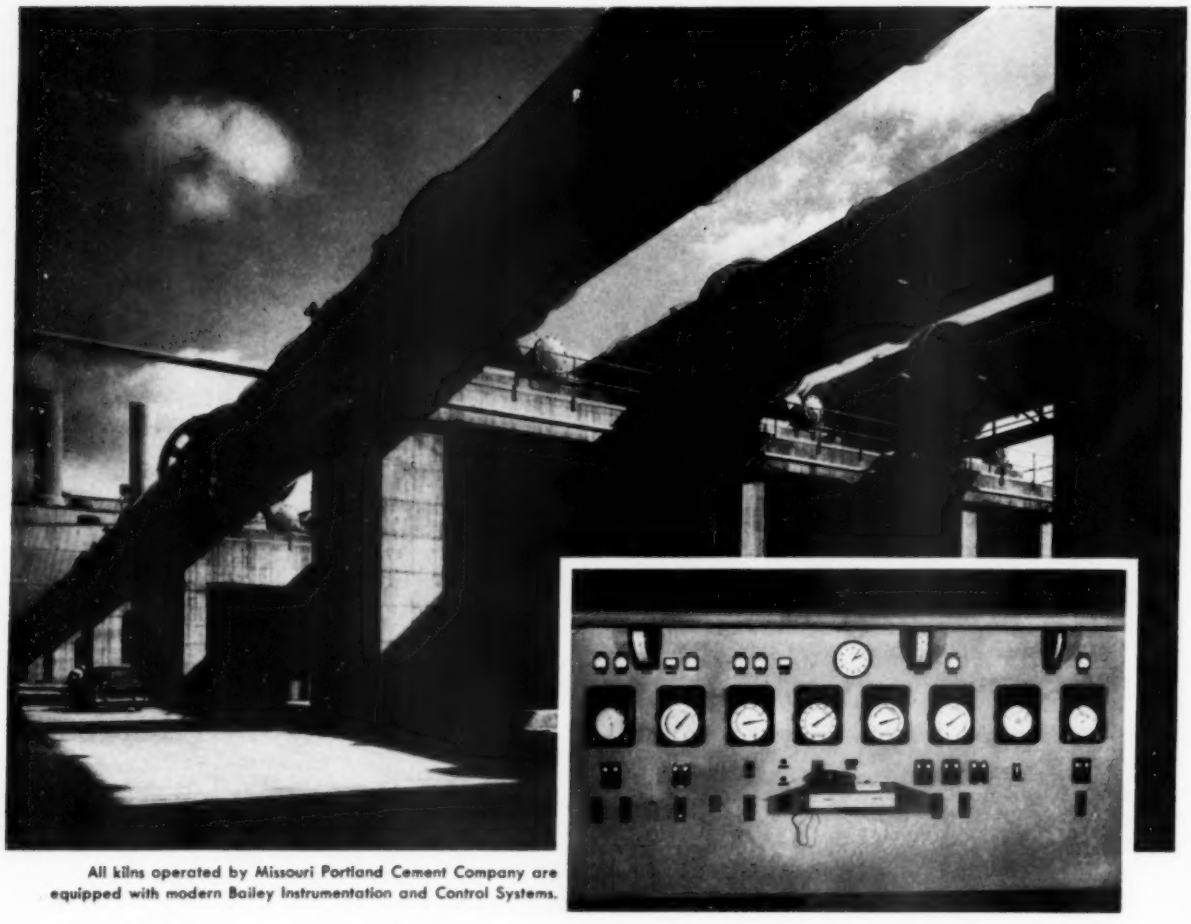
The extra strength of Maxipower V belts comes from its new rubber compounds, the tough fibers used in its load-carrying cords, and the new "deep V" design. Because of this design the belt's load-carrying cords are supported so completely that each has an equal share in the load—none "loaf".

All Maxipower V belts are heat-resisting, oil-resisting at no extra cost. Belts with static conducting properties can also be ordered *at no extra cost.*

For further information and help in selecting Maxipower belts for your drives, call your B.F.Goodrich distributor. *B.F.Goodrich Industrial Products Company, Dept. M-794, Akron 18, Ohio.*

B.F.Goodrich V belts

Enter 1202 on Reader Card



All kilns operated by Missouri Portland Cement Company are equipped with modern Bailey Instrumentation and Control Systems.

How to control the digestion of giant kilns

These giant kilns have delicate stomachs. But the Missouri Portland Cement Company knows how to coddle them to get maximum capacity, uniform product and low fuel rate.

They do it with a Bailey Control System with a central Control Panel where a single attendant has complete control of the variables of combustion and heating.

Because the system keeps continuous chart records, the Burner can check the reading and trend of Kiln Speed, Exit Gas Temperature, % Oxygen in Exit Gas, % Combustibles in Exit Gas, Kiln Shell Temperature, Hood Draft, Temperature of Secondary Air Leaving Cooler, Temperature of Coal-Air Mixture from Coal Mill, Fuel Gas Flow, Feed End Draft, Kiln Speed, Cooler Speed, Cooler Fan Discharge Pressure, Cooler Undergrate Pressure, Cooler Air Flow, Coal Mill Primary Air Pressure, Coal Mill Exhauster Fan Suction, and Fuel Gas Flow.

The system works so dependably that week-long kiln runs have been made without the operator touching anything.

Let a Bailey Engineer help you plan for peak performance! For additional information write for a Bailey Kiln Control Folder. C-14

BAILEY METER COMPANY

1039 IVANHOE ROAD • CLEVELAND 10, OHIO

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FOR ROCK DIGGING

Where it's Toughest!

A few months ago this area was uncleared land. In June, this big Northwest 80-D, 2½-yd. Shovel started removing overburden for the Ramona Stone Co. of Marion, Ill. Today, it is an active quarry and destined to be the largest limestone quarry in Southern Illinois. The daily production runs around 2,500 tons. The 80-D loads 12-yard Payhaulers and keeps a 36 x 45 Cedarapids Breaker busy.

It takes a real Rock Shovel to open up and make an operation like this successful. Northwest Shovels are *real* Rock Shovels. They bring a combination of advantages that have made them outstanding in handling heavy rock work and excavation. They make hard digging easy and easy digging easier. Machinery Bases and Machinery Side Frames are heat treated, cast steel to take the shocks of digging. The Feather-Touch Clutch Control makes operation easy and yet retains the feel of the load.

The Helical Gear Drive, the Cushion Clutch, Uniform Pressure Swing Clutches and the Northwest Dual Independent Crowd not only play a part in better output but they combine to assure performance when it is needed.

Your Northwest is always ready to go. We hear it everywhere, and Northwest users will tell you so. We'd like to tell you more about Northwest advantages. *Ask for a catalog on the size machine you need.*

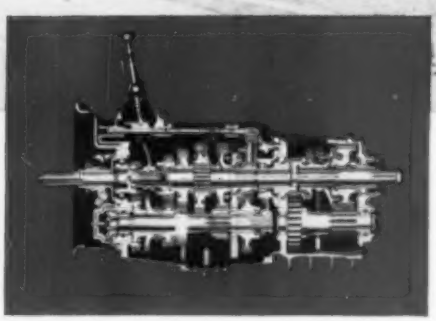
NORTHWEST ENGINEERING COMPANY
135 South LaSalle Street, Chicago 3, Illinois

NORTHWEST

Always Ready to GO

NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
¾ Yd. to 2½ Yd. Capacity	13-Ton to 60-Ton Capacity	¾ Yd. to 3 Yd. Capacity	¾ Yd. to 2½ Yd. Capacity	25-Ton to 35-Ton Capacity



Wells Overseas, Ltd., an associated company of Wells Cargo, Inc., Reno, Nevada, is using 16 KW-Dart 802-AT Tractors equipped with Fuller R-1160 ROADRANGER Transmissions in iron mining operations 250 miles south of Lima, Peru.

Geared with
FULLER ROADRANGERS

...91-TON LOADS

with double bottoms...

Featuring 9-speed Fuller R-1160 ROADRANGER Transmissions, 16 KW-Dart 802-AT Tractors handle up to 91 tons of iron ore at a time on a mining operation in Peru.

Owned by Wells Overseas, Ltd., the 320 hp KW-Darts use the single-stick, semi-automatic ROADRANGERS to provide maximum performance on the cross-country haul from crusher to the seaport of San Juan. Because the diesel engines can operate in the peak torque and hp range at all times, the 72-mile round trip is made in 3½ hours, including time for loading and unloading.

Ask about the Fuller Transmission designed to boost *your* profits.

STANDARD EQUIPMENT
on Fuller Off-Highway Transmissions

- **COUNTERSHAFT INERTIA BRAKE** . . . for quick, easy upshifts without double clutching . . . faster work cycles
- **PRESSURE LUBRICATION and FILTRATION SYSTEM** . . . for longer gear and bearing life . . . greater availability, less maintenance

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Traylor-Made . . . means rugged dependability in heavy machinery. 60 years of industrial engineering experience goes into our ROTARY KILNS, PRIMARY and SECONDARY GYRATORY CRUSHERS, JAW CRUSHERS, APRON FEEDERS, BALL MILLS.

write for bulletins, giving complete information.

TRAYLOR ENGINEERING & MANUFACTURING
DIVISION OF FULLER COMPANY
1524 MILL STREET, ALLENTOWN, PA.

A121

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WHAT'S HAPPENING

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

March, 1960

A pictorial spotcheck of several residential areas is being made from time to time from low flying planes. Why? To compare construction starts with building-permit reports. It is part of the Census Bureau's effort to locate the reason for discrepancies in construction statistics. Some electric utilities also have been asked to supply the bureau with monthly tabulations of new connections to homes, and new surveys are covering maintenance and repair expenditures, a hitherto-neglected factor. The move to improve construction data began when an error was discovered: Although statisticians estimated that about 8.1 billion homes were built from 1950-56, the figure is probably closer to 10 billion. Some of the blame may lie with small communities and suburban areas that neglect to report permits, or do so erratically.

Claiming superiority to American or any other turnpikes are builders of the London-Birmingham motorway, the first of its kind in England. The British say their carriageways are wider than the general run of autobahn; they have a central reserve dividing them, unlike the Italian autostrada, and the "flyovers" are better and of cleaner design. Furthermore, they are smoother than American roads. A "bumpometer" measured the smoothness, detecting 23 slight jars to the mile on the motorway, compared to 30 to the mile on American turnpikes. The London-Birmingham road is the first to be completed in a full network of motorways planned.

A prospecting venture aimed at penetrating the center of the earth is gaining momentum. This is "Project Moho," sponsored by the National Academy of Sciences. Drilling through the earth's crust to its core, scientists will probe our planet's composition, magnetism, radioactivity and geologic history. Most intriguing is the makeup of the mysterious Moho (Mohorovicic discontinuity), a layer unknown in substance, nature and thickness, that separates the rocky crust from the metallic core. Where will the project take place? Probably in the Pacific Ocean west of Mexico, where the earth's crust is thought to be relatively thin—between 5.3 and 6.6 miles. Methods developed by the petroleum industry in offshore oilwell drilling will be used in the experiment which is expected to take four years and $15 million.

Fiber glass sales to the boat market should be buoyed up this summer. Wall Street Journal says that boats made of the material are contending for a larger slice of the pleasure craft business. Afloat on a wave of prosperity, glass fiber boat salesmen point out the reason: There's no chance of dry rot or deterioration from weather, seams and fastened joints are eliminated and color can be impregnated into the hull. To these maintenance-saving features, they add another selling point: Such boats, produced in volume, undersell competing sizes made of wood.

You can see it coming—manipulation of vehicles by remote controls. Not content to drive your car, they soon may take over the service station where you buy gasoline. And if you take a train, don't be surprised if it is crewless. These are developments of the electronic age. (1) Motor vehicles: Looking to the day when they are guided down the road by a wire, General Motors laboratories are working on devices to get drivers through the transition period. These include a communication system to provide road sign and emergency information and a path warning device to keep vehicles on a centerline. (2) The service station: Bowser, Inc., is introducing a fueling system in which hoses may be installed in overhead racks or may retract into the ground, apart from units that measure the sale. This system also can accommodate data processing equipment to handle accounting. (3) The train: Declaring completely automatic trains "practical," Union Switch & Signal division of Westinghouse Air Brake Co. is filling an order for remote-control equipment. Plymouth Locomotive Works, a division of Fate-Root-Heath Co., will use it for demonstrations, and make it available as an optional feature. Meanwhile, Union Switch has set up tests to run subway trains without crewmen in the New York subway system.

One of the highest rock fill dams in the world may well be the projected Cougar Dam near Eugene, Ore. The $24 million dam on the South Fork of the McKenzie River will be about 1,500 ft. long on the crest and about 450 ft. from base to crest at the deepest point. More than 11 million cu. yd. of rock will be used with about 7½ million cu. yd. to be 12 x 24-in. rock placed in 3-ft. layers. The builders, Merritt-Chapman & Scott Corp., will obtain the necessary rock from quarries designated by the Corps of Engineers.

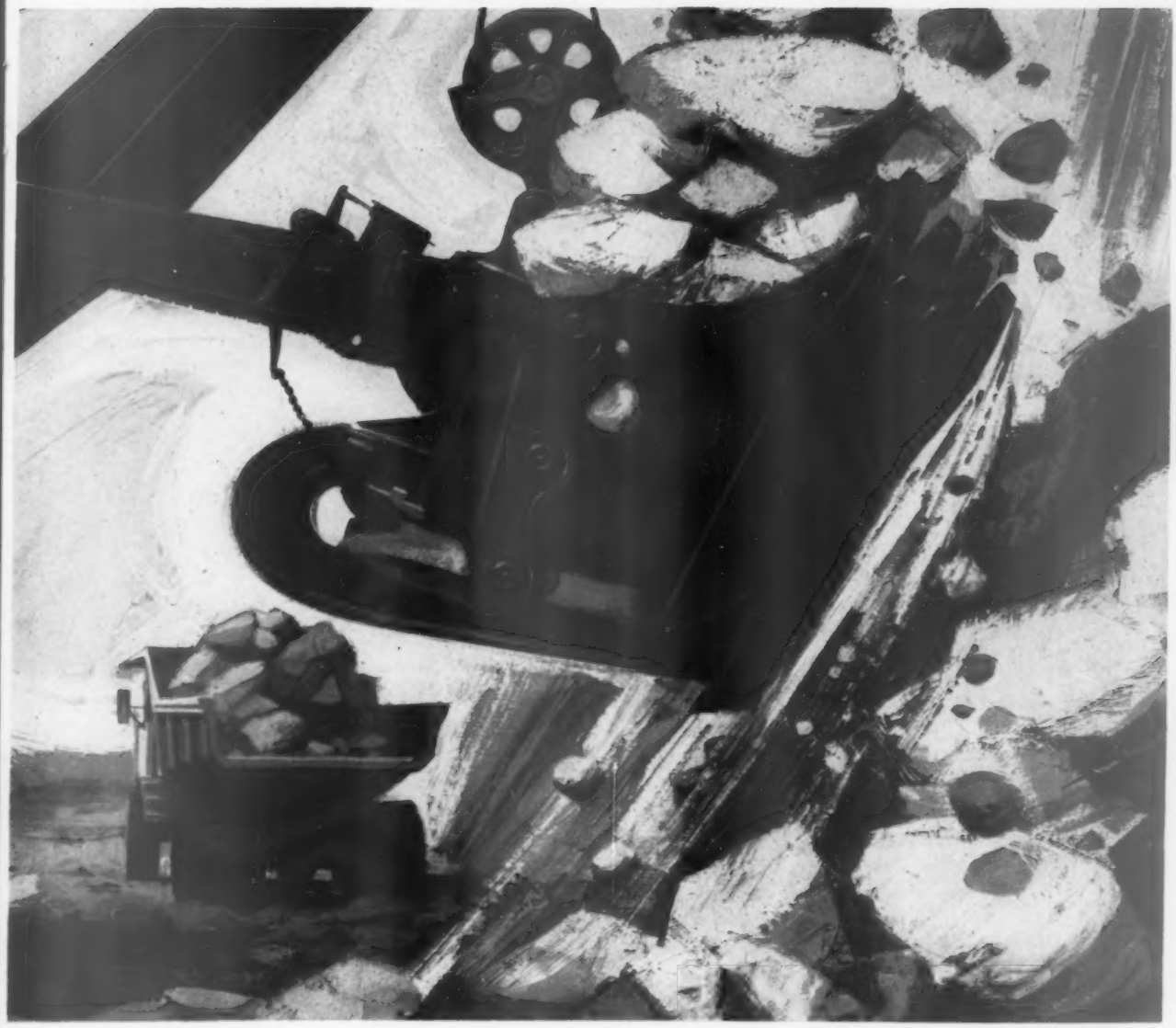
Detachable tire treads are the latest boon to European vehicle owners. Available now or in the near future in Italy and Great Britain, they permit doffing the old tread and adding another with ease. You merely deflate, switch treads, reinflate, and the tire is ready to roll. You can change to snow treads in the same way. Cost? About ⅛ that of a whole new tire.

New uses for bentonite have given the Canadian industry a shot in the arm. Long used as a foundry sand binder and oil well drilling mud, bentonite is now used to fight forest fires. When sprayed on trees it acts as a fire retarder, helping to keep the blaze under control. The Financial Post reports that bentonite suspensions sprayed from airplanes check forest fires, and that ground crews plaster trees with the material to make firebreaks.

Metals can be formed into complex shapes underwater by detonating explosives directly above a blank that is placed over a die or basic work form. The idea originated in wartime, when navy men saw ships' hulls deformed without rupture after torpedoes had exploded near them. Now the magazine Explosives Engineer reports its application at a Texas aircraft plant. Though more costly than other metal-forming operations, the new method could be justified when it permits relatively simple and inexpensive tooling, reduces the number of operations, minimizes scrap or eliminates the need for additional press capacity. Most attractive to a research engineer is its potential of bringing aircraft production close to the ideal state—where each new product can be "made in two pieces and glued down the middle."

TANK-TOUGH LINK-BELT SPEEDERS...

treat rock like dirt!



All-welded and stress-relieved — stamina, strength and guts to shrug off years of hard work! Tough, impact-loving Link-Belt Speeders thrive on the roughness of rock. They're built for rugged duty with all-welded, stress-relieved, jig-bored frame assemblies. Precision boring permits parts interchangeability, steps up machinery strength under stress. Extra-size, heat-treated machine components transmit more of rated hp to swing, hoist, travel, slam the dipper in. All-welded shovel-booms and dipper sticks . . . all-manganese buckets soak up strains without a shudder. Shafts, gears, bearings are precision aligned, stay aligned. No shims needed. Clutches are self-compensating for heat and normal lining wear.

Split-second Speed-o-Matic controls cut operator fatigue—power steer and more usable hp spurt rock output! Nudge a Speed-o-Matic power hydraulic control lever. Feel this brute obey! Trigger-fast shovel reflexes produce up to 25% more cycles per 8-hour shift. And finger-tip Speed-o-Matic power steering gives you double-quick maneuverability in, out, around blast rock, crusher or truck. No sloppy mechanical wear and repair. Payoff: top-profit rock production for *years* . . . at rock-bottom cost. For information on the complete line of shovels and cranes (½- to 3-yd., 8- to 75-ton capacities), see your distributor or write LINK-BELT SPEEDER CORPORATION, Cedar Rapids, Iowa. 101-60-N

LINK-BELT SPEEDER

It's time to compare . . . with Link-Belt Speeder

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EDITORIAL

by GEORGE C LINDSAY

Low-cost help

A PRODUCER CALLED AT OUR OFFICE NOT LONG AGO. He wanted help on a problem. It didn't take us long to dig back a couple of months to find an article from ROCK PRODUCTS magazine that gave him the answer he was looking for.

He was pleased, but we were concerned. Why hadn't he noted the article himself, being a good subscriber that he is?

"Just don't have enough time to read these days," was part of his answer. Seems that he gets only one monthly copy of ROCK PRODUCTS at his company. Sometimes, when he's unusually busy (this is most of the time), he passes the magazine along to his key men before he reads it.

This is good practice, but it didn't pay off for him this time. Apparently, his men are busy, too. If they saw the article referred to, they didn't bring it to his attention.

The call to our office cost Mr. Producer money. But he figured the visit was worth the cost, since he got the answer he wanted. Of course, we're always happy to have producers call on us, and we appreciate an opportunity to be of service. But this situation left a real opening for us. We suggested that he could have spent 10 minutes, plus his three-dollar bill for the subscription, to get the same result.

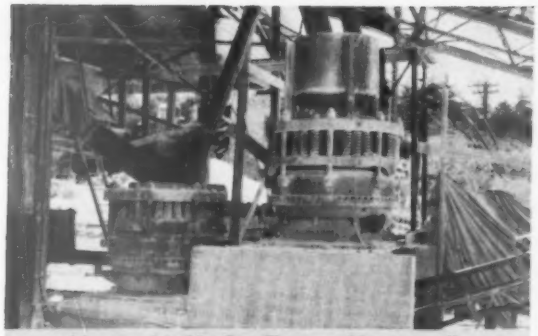
Better yet, he could have spent a few more three-dollar bills to be sure his key personnel got the magazine at home every month. They'd have more time to read it there. Maybe they'd have caught the article he missed—the one that told how someone else had solved a problem like his.

After all, a magazine is a tool, and it ought to be used like one. It costs no more than a good pair of gloves. We're sure our visitor would not let his employes tackle a job at the plant without the proper tools and equipment. But, to our way of thinking, he did.

The printed word is a time and money saver. Suppose we had no books or magazines and everyone had to get the dope himself? It's ridiculous to consider.

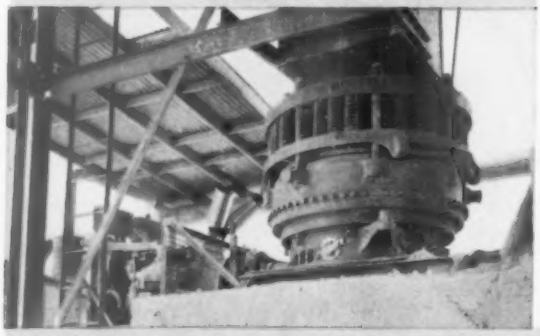
Only one good idea a year from a magazine will more than cover the cost of getting it. If we don't produce more than that—much more—we're slipping.

Put ROCK PRODUCTS in your tool kit. Make it available to all of your key men, too. Where else can you get such a return on your investment?

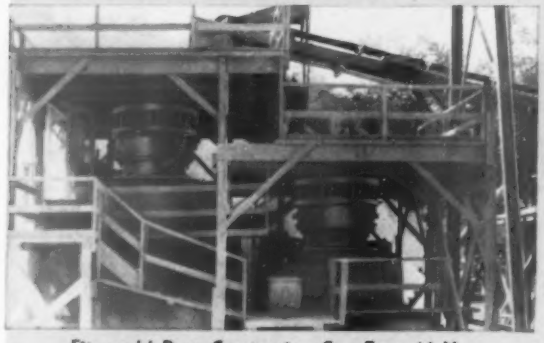


Vermont Marble Co., Florence, Vt., are well satisfied with their 36-S and 36-FC Gyraspheres.

This 48-S Gyrasphere turns out top tonnage for International Lime & Stone Co., Chazy, N. Y.



Crushing granite at Lunenburg, Mass., this 36-FC Gyrasphere is doing a fine job for P. J. Keating.

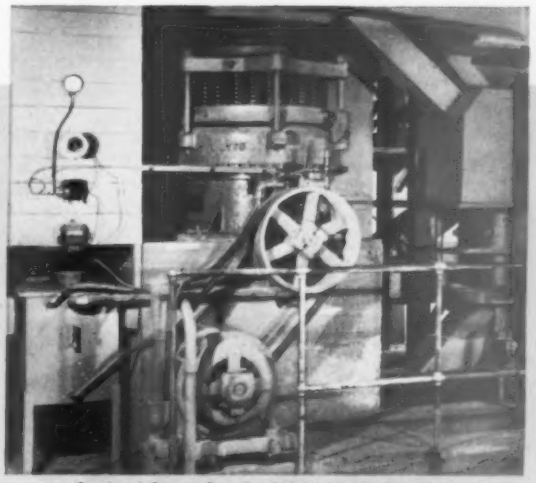


Fitzgerald Bros. Construction Co., Troy, N. Y., like their 48-S and two 36-FC Gyraspheres.

in New England and New York HARD ROCK QUARRIES...

TELSMITH Gyraspheres

Here—where rock is as hard as it comes—the Telsmith Gyrasphere has proved itself. With highest capacity, low power needs, lowest upkeep—to give more and better aggregate *at lowest cost per ton* at a greater profit. Four sizes: 24″, 36″, 48″ and new 66″ . . . for coarse or fine crushing. Get Bulletin 274.



Y-20 1059

Cortland Stone Co., Peekskill, N. Y., find their 24-S Gyrasphere very efficient.

SMITH ENGINEERING WORKS

508 E. CAPITOL DRIVE **MILWAUKEE 1, WISCONSIN**

Representatives in Principal Cities in All Parts of the World • Cable Address: Sengworks, Milwaukee

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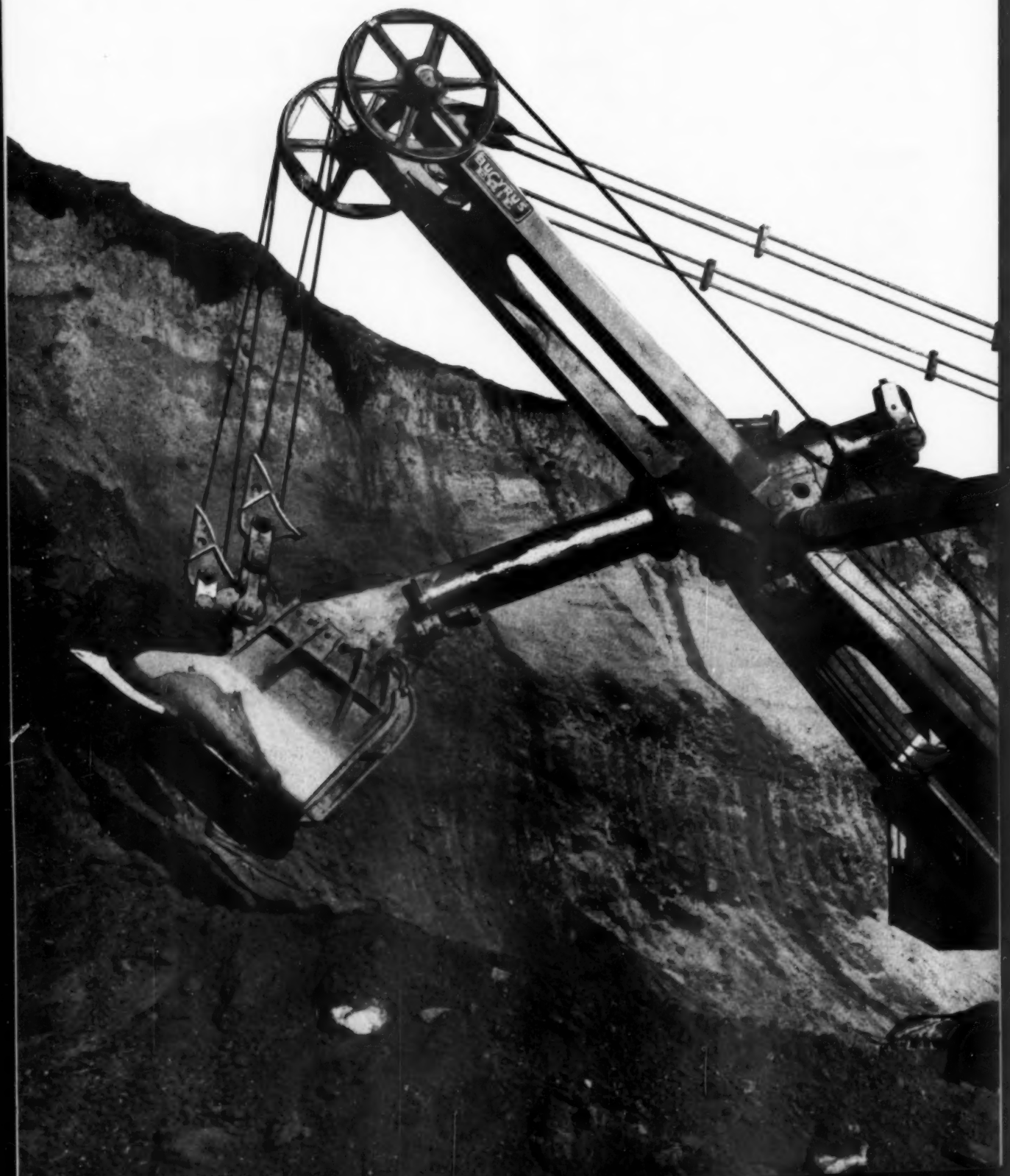
going big?.



. . go electric

with Bucyrus-Erie!

. . . announcing NEW electric control that wipes slate clean on "can'ts" of old-style machines!

NEW CONTROL — only on Bucyrus-Erie electric excavators, a modern control that sets a new standard of electric operation to help you make every assignment more profitable!

SPECIFICALLY, with this new Bucyrus-Erie control there's no excessive heat loss, even in stall conditions. In tough digging, torque is increased, speed reduced — you move on through the digging cycle!

GRADUAL TURNS can be made on hard quarry floors in either direction without forward-reverse jockeying so often damaging to crawlers.

There are **NO OPERATING CLUTCHES** with this new Bucyrus-Erie control. Each function has its own power source. Power is used for that specific function — no other. You get full power up and power down for hoisting and lowering.

CROWD MACHINERY is mounted on the revolving frame, not on the boom. Weight works for you without robbing front-end output. Digging ranges are greater than other electrics or diesels in same size bracket!

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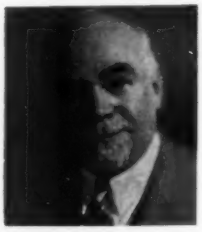
ROCKY'S NOTES

by NATHAN C. ROCKWOOD



Structural chemistry of minerals

THE CAPTION ABOVE is not the title of the new textbook we are reviewing, but it is the angle of the text which most interests us as a student of cement and concrete. The book is the 17th edition of Dana's "Manual of Mineralogy,"* revised in 1959 by Cornelius S. Hurlbut, Jr., professor of mineralogy, Harvard University. The fact that this famous textbook has gone through 17 editions is proof of several things: (1) That some parts of, or method of treatment, in the original text are hard to improve upon; (2) that the science of mineralogy has been developing or unfolding at an unprecedented pace; (3) that mineralogy consists now of much more than study of minerals as such, for by use of modern methods and instruments, mineral crystals have taught researchers a great deal about structural inorganic chemistry.

However, what we should like most to see is a discussion of cement and concrete by such a mineralogist as the author of this new text. That is out of the question in a book on "mineralogy" because, by definition, a mineral "is a naturally occurring chemical element or compound formed as a product of inorganic processes." Thus portland cement, lime and gypsum plaster, while they are "mineral products," are not minerals. Portland cement and concrete are mentioned in this book but once or twice, and then only in connection with the uses of limestone. Therefore, any inferences or similarities that this reviewer or the reader may make in trying to tie mineralogy into a discussion of cement, concrete, plaster, etc., must be his own ideas and not our author's.

While cement researchers tell us that dicalcium silicate is a natural but rare mineral, it finds no mention in this latest edition of Dana. At the same time, there is also no mention of economically important minerals known to us as pozzolans. One may, however, find food for thought in such statements as this: "Perhaps the most important and significant limitation placed on the definition of a mineral is that it must be a chemical element or compound; a restriction arising from the consistent picture of the structure of a crystalline solid as an indefinitely extended framework of atoms, ions, or groups of atoms arranged in regular geometric patterns. Such a solid must, of necessity, obey the laws of definite and multiple proportions and be as a whole electrically neutral; hence, it must have a composition expressible by a chemical formula. Thus all mechanical mixtures, even if quite uniform and homogeneous, are eliminated." From that, we may draw the conclusion that concrete is merely a mechanical mixture. Nevertheless, researchers in cement and concrete say that the hardened cement consists essentially of minute mineral crystals.

The most valuable mineral constituent of hardened cement, as a bonding agent, according to cement researchers, is a hydrated calcium silicate expressed by the chemical formula, $3\ CaO \cdot 2\ SiO_2 \cdot 3\ H_2O$. In this formula, if it is in the form of a crystal, we have: 3 Ca = 6 + 2 Si = 8 +, 3 H_2 = 6 +, or a total positive electrostatic charge of 20. The negatively charged ions are 3 O = 6—, 4 O = 8—, 3 O = 6—, or a total of 20, which would just balance the positive charge and make the crystal structure neutral, as it must be to be stable. However, it is readily seen that any slight change in the amount of any one of the four constituents, Ca, Si, H or O would throw the neutrality off balance. That is just what happens in the hydration and hardening of a crystal of this or any other calcium silicate formed in the manufacture of portland cement. The proportions of lime and silica always vary even in the smallest samples, and the amount of water retained in the agglomeration of crystals varies according to tempera-

Please turn to page 136

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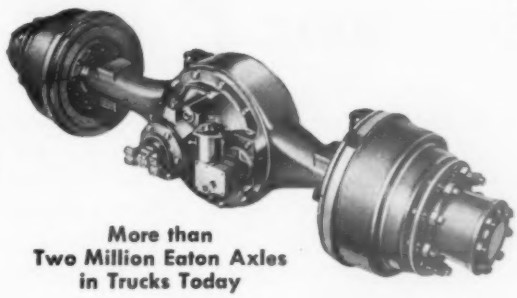

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WASHINGTON LETTER

by EDGAR POE

State Labor Laws

A number of major changes in State labor laws took place in 1959, according to a roundup of State legislative enactments by the Department of Labor. Unemployment insurance was raised in 22 states, workmen's compensation benefits were increased in 29 states, provisions for lengthening the period of unemployment insurance were made in 23 states, amendments to the minimum wage laws were adopted in eight states.

A minimum wage law was enacted for the first time in North Carolina covering both men and women, with statutory minimum wages set at 75 cents an hour. New laws in Maine and Washington set a $1 statutory minimum wage to apply to both men and women. Vermont and Alaska raised their minimum wage from 75 cents to $1 an hour. New Hampshire and Massachusetts raised their wage floor from 85 to 90 cents, respectively, to $1 for most occupations.

In the field of industrial relations Nebraska banned secondary boycotts, New Mexico prohibited certain types of picketing, Wisconsin repealed the prohibition against political contributions by unions, and California and Ohio enacted so-called fair employment practice acts. Not a single state passed a "right-to-work" law.

Major road Law is due Next year

The executive vice president of the American Road Builders' Association, Louis W. Prentiss, predicts that there will be a Highway Act passed at the current session of Congress, but "it will likely be only the equivalent of a motor tune-up." At the same time he points out that a major overhaul of the Highway laws is scheduled for 1961.

Meantime, there are three separate inquiries being conducted in connection with the Highway program. The House Ways and Means Committee is studying the Highway Trust Fund method of financing. A House Public Works Subcommittee headed by Representative John A. Blatnik, Democrat of Minnesota, is looking into some of the many complaints of wrong doing relative to the vast Interstate program. A third study is being conducted at the direction of President Eisenhower.

The White House study is headed by General J. Stewart Bragdon, the public works coordinator for the President. However, one of the most important, if not the most important, highway reports ever submitted to the American Congress will be made a year from now: The Bureau of Roads will have a new four-year economic study on the benefits, beneficiaries and cost estimate of building the 41,000-mile multi-laned, stop light-free system that will connect every city of 50,000 or more.

Peru Plant

International Finance Corporation has agreed to invest $300,000 in Durisol del Peru, a Peruvian company, formed to manufacture "durisol," a precast lightweight building material made of chemically treated vegetable fiber and cement. The plant, to be located in Lima and sponsored by a group of Peruvian industrialists and investors, is expected to begin production by the latter part of 1960. Capacity will be about 630,000 square meters a year. The density of durisol is one-third that of ordinary clay brick and concrete block.

Union seek Public interest Legislation

Still feeling the sting of a rebuff from passage of the Landrum-Griffin labor curbs act in 1959, the AFL-CIO has launched on Capital Hill a new offensive. The powerful central union is seeking to get passed at the current session what it calls "enlightened public interest legislation." At the same time the AFL-CIO wants to block what it describes as further "unfair, restrictive" labor legislation.

Despite the union goal, however, there is every indication that the coalition of Southern Democrats and Republicans are not only going to stand pat on the 1959 legislation, but might do a little further tightening of controls which the unions do not want. Representative Landrum maintains that the unions, for the good of the country, must be put under the anti-trust laws like business.

Valuable clay Deposits found In Maryland

Discovery of widespread deposits of clay in Southern Maryland that may be suitable for the manufacture of lightweight aggregate of superior quality, has been made by both Federal and State agencies. A description of these deposits has been placed on file by the Geological Survey for public inspection.

The Geological Survey and the Bureau of Mines said that many small samples of clay taken from the St. Mary's formation at widely scattered localities in the southeastern parts of Calvert and St. Mary's Counties, when retained in a small electric kiln for 15 minutes at temperatures between 2,000 and 2,200 deg. F., yielded products that compare favorably in weight, strength, water absorption and color with some of the best expanded aggregates produced in this country for use in preparation of lightweight concrete.

The Department of Interior said: If a sufficient amount of the sampled clay will respond as satisfactory when fed in large quantities to rotary kilns as did some of the specimens that were fired in the small kiln, the resources of such material available in southern Maryland should satisfy much of the growing demand for light aggregate along the Atlantic Seaboard. Occurrence of much of the material at sites close to tidewater suggests that its transportation by water to distant markets might even be profitable.

Asphalt and Concrete gain

The American forestry products industry has before it a rather glum industry report. Federal Housing Commissioner Julian H. Zimmerman reported that in the past 50 years lumber has lost 70 percent of the roofing market to asphalt shingles, half of the window market and that concrete slab is replacing wood flooring in many cases, plus the fact that aluminum is now challenging wood as siding and roofing.

Congress may Expand social Security laws

Congress might raise the minimum wage at this session, and bring a few million more employes under wage and hour law provisions. The White House is opposing the measure which would raise the minimum wage from $1 to $1.25 on the ground that it is inflationary in its aspects. Some members predict there will be a compromise like $1.25 an hour.

For the last five election years Congress has liberalized the social security laws. This election year may be no exception. Liberalization obviously means more taxes. That is why the taxes went up January 1 from $120 to $144 (maximum) on earnings up to $4800 a year. Even if Congress did not increase the tax schedule during the next several years, social security taxes are going up. Here is the schedule in maximum figures: For 1960-62, $144; 1963-65, $168; 1966-68, $192, and 1969, $216.

Pending liberalization Bills that have substantial support would provide 120 days of hospitalization or nursing care for all aged social security recipients, and a bill that would lower the age to 35 the head of a household eligible to draw social security in case he or she becomes totally disabled.

Sand, gravel, Clays, cement Output gains

Mine and quarry production of nonmetal construction materials reached a record high in 1959. The Bureau of Mines said stone, sand and gravel, clays and cement gained from 10 to 15 percent over 1958.

Blast-furnace slag for use in portland cement was in high demand, but an acute shortage developed growing out of the 116-day steel strike. Increased construction activity resulted also in greater demand for cement. As a result 1959 cement production was 9 percent higher than in 1958 and 4 percent higher than the 1956 peak.

The Interior Department said four new cement plants were built and others were expanded. Annual capacity reached 410,000,000 bbl. Gypsum and gypsum products neared new highs because of residential construction.

Clay output rose about 10 percent because of greater demand for refractories, continued high level of activity in the building industry, and development of new processes for making clay-bonded lightweight building block.

Tallulah's Grandfather

The late Senator John H. Bankhead of Alabama, father of the late Senator John Bankhead, Jr., and Speaker of the House William B. Bankhead, and grandfather of Tallulah Bankhead, the famed actress, is credited by some students of government as being a congressional father of the Federal road system in this country.

The Federal Highway running from Birmingham, Ala., via the home town of the Bankheads at Jasper, Ala., to Memphis, Tenn., is known as the "Bankhead Highway" in honor of the memory of the first Senator John Bankhead.

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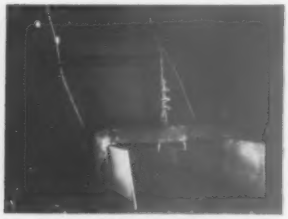

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SAYS HARRY R. KUNZ
PRESIDENT, KUNZ PAVING CO.
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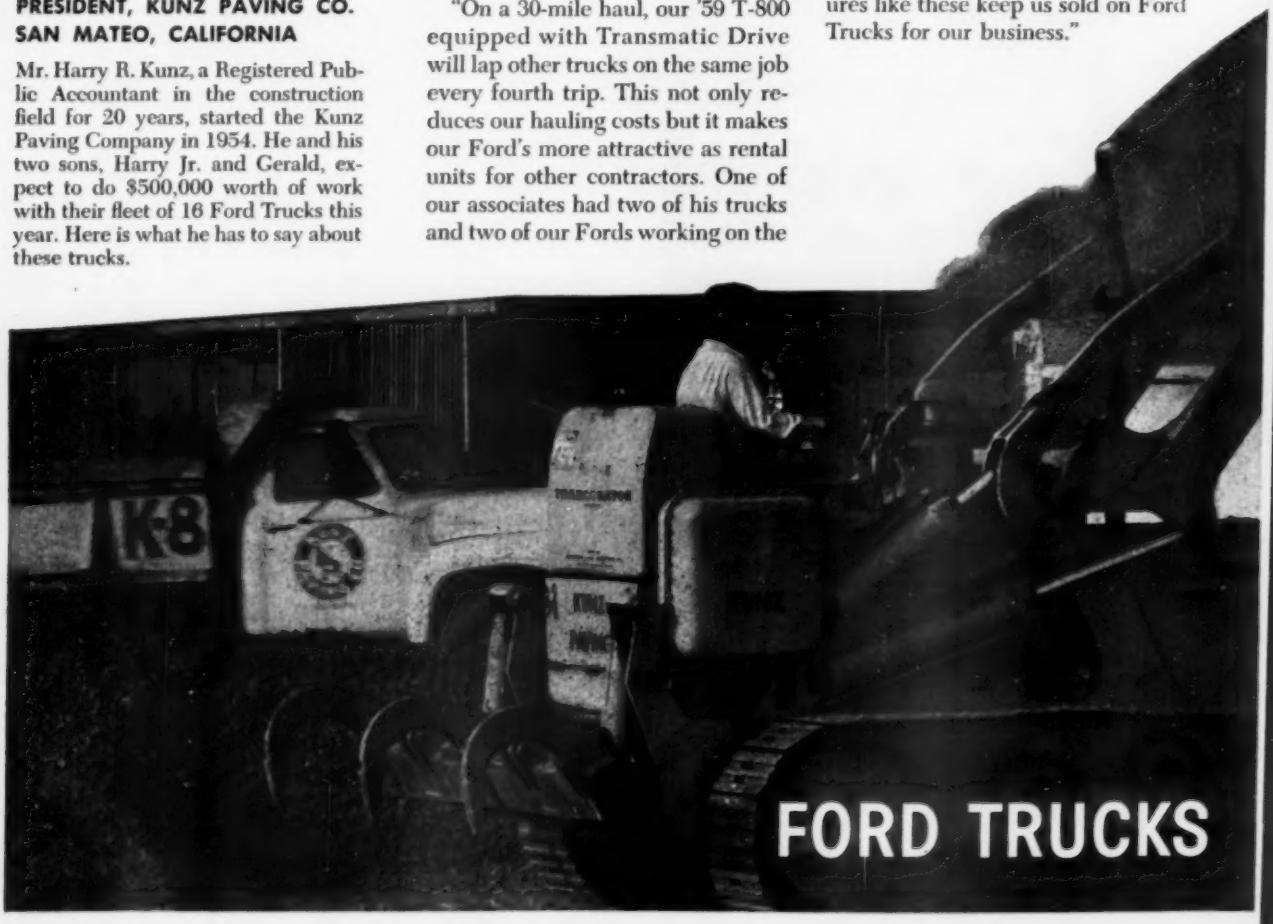
Mr. Harry R. Kunz, a Registered Public Accountant in the construction field for 20 years, started the Kunz Paving Company in 1954. He and his two sons, Harry Jr. and Gerald, expect to do $500,000 worth of work with their fleet of 16 Ford Trucks this year. Here is what he has to say about these trucks.

"Our experience with Fords has proved them to be the best all-around truck we can buy! They haul more payload, cut down considerably on trip time and cost less to operate and maintain.

"The lighter chassis weight of the Ford Tandems lets us carry as much as 2,500 pounds more than competitive makes. This extra payload means that we can haul as much in ten trips as the others do in eleven. Our Fords will beat them on a trip-for-trip basis, too!

"On a 30-mile haul, our '59 T-800 equipped with Transmatic Drive will lap other trucks on the same job every fourth trip. This not only reduces our hauling costs but it makes our Ford's more attractive as rental units for other contractors. One of our associates had two of his trucks and two of our Fords working on the same job. He actually paid for the rental of our trucks by the extra trips they made.

"Our cost records, set up on an hourly basis to make it easier to prepare bids, show that the longer life built into Ford Trucks makes them less costly to operate. We have one '56 Ford T-750 with over 100,000 miles on it that we use as a base for our tandem hauling costs. In spite of its high mileage – gas, oil, tires, maintenance and repairs amount to only $2.08 per hour. Facts and figures like these keep us sold on Ford Trucks for our business."



payload on our other trucks on the same job!"

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Ford Six delivers 13.1% better gas mileage in second running of Economy Showdown U.S.A.* Standard 1960 ½-ton pickups of the five leading makes were purchased from dealers just as you would and run both empty and loaded, over flat terrain and hills, at low and high speeds, under city traffic and retail delivery conditions.

Certified results show the Ford Six won *every* test—with a combined Ford advantage for all tests of 13.1% more mpg than the average of the other makes tested. In fact the Ford Six beat one competitive pickup by a whopping 27%.

The 1960 Fords not only deliver the best gas mileage of the leading makes—but they do it without sacrificing any of the performance characteristics for which Ford is famous. And, this year, if you buy a Ford instead of a competitive truck, you can be sure to save!

Check the certified records for yourself in your Ford Dealer's "Certified Economy Reports" . . . see and drive the new Ford Trucks . . . check the price tags . . . *and you'll save for sure!*

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LABOR RELATIONS

A ROUNDUP OF ACTUAL DAY-TO-DAY IN-PLANT PROBLEMS AND HOW THEY WERE HANDLED BY MANAGEMENT MEN

How would you decide?

Is a 3-day suspension too severe for an employe who regularly leaves his job 5 minutes before the lunch period?

What Happened: The company had just signed a contract for new business, but the price was pretty tight. If any money was to be made, it meant that efficiency must improve. One of the problems which plagued management was the tendency of employes to knock off and go to the rest rooms 5 or 10 minutes before the lunch period. This continued in spite of the fact that there was a rule which read:

"A specific lunch period is assigned to you. It is the responsibility of each employe not to leave his work area before the lunch period begins and also to be at his work area when the lunch period ends."

To enforce this rule, the company asked the supervisors to talk to the employes and get them to obey. Talk proved of little avail. Warning notices were then given, and John Billings was one of the employes who was reprimanded. When John was caught violating the rule again and again he was given a 3-day layoff.

"That's a whopping penalty," John protested. "You can't make a rule to stop an employe from going to the washroom. This ain't Russia."

The company was surprised at John's anger. It said that it had no regulations prohibiting employes from going to the rest rooms. But when a worker made it a practice (as John did) to quit five minutes before the lunch hour every day, he was loafing and not answering a need.

Was the company:
Right? ☐ **Wrong?** ☐

What Arbitrator Eigenbroad ruled: "The facts as presented, and the exhibits to substantiate some of the facts, clearly prove that the company insisted on obedience to its rule that no employe leave his work area before the sounding of the whistle designating the lunch period. The evidence further showed that the company allowed its employes to go to the rest rooms as necessary; and that the number of visits and the time of each visit to the rest rooms by the employes was not regulated by the company. Therefore the company's action against John Billings in giving him the disciplinary layoff was not unreasonable."

Does a union have a right to inspect a company's personnel records?

What Happened: The company had a long-standing policy of giving carbon copies of warning notices to the employes involved and to the union.

In order to improve its record keeping, the company devised a new form. It was called "Employe Performance and Conduct Form." This form was to be used by supervisors as a way to rate employes. The union maintained that it had a right to inspect these forms because if they contain any criticism of the worker, then in effect, this record amounts to a "warning slip."

The company answered that this would not be done. It said that management had a right to get up any records it wants, and neither the union nor the worker can poke around the files. The issue came to arbitration.

Was the company:
Right? ☐ **Wrong?** ☐

What Arbitrator Belkin ruled: "I shall not require an employer to disclose any of his records or methods of housekeeping to the union. No union has a right to such information any more than a company has the right to an examination of the union records. Therefore, I shall hold that the company may develop any forms it wishes and that the forms are not subject to negotiation or revision or examination by the union."

(Continued on page 30)

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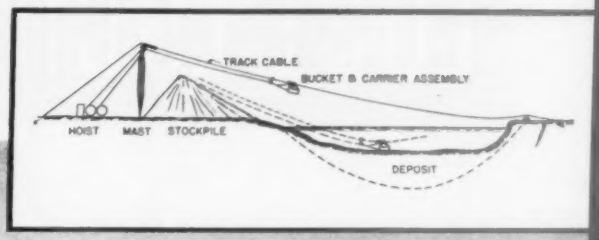
A Sauerman Slackline Will Recover It For 6 Cents A Ton



Plants Like This Are Turning Hard-To-Reach And Deep Materials Into Increased Profits

One way to beat increasing land values and depleting resources is to get all the material out of your present deposit. You can do this with a Sauerman Slackline Cableway. The machine starts at ground level and continues to work at depths and distances that cannot be reached with other excavating equipment. A Slackline will dig 100 feet below water and haul loads over 1000-ft. spans.

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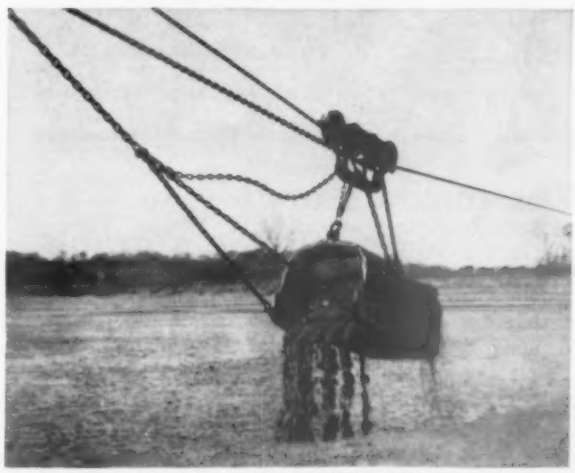
Another advantage of the Sauerman Slackline is that it can be operated continuously in all types of weather. This permits building a ready stockpile to meet seasonal or unforseen demands.

If you are starting a new plant or updating an existing one, do it with the machine that gets the most out of your deposit at lowest possible cost. Sauerman Slacklines are built in sizes up to 3½ yds. to match your tonnage requirements. Write or call about your deposit. We'll recommend the proper machine.



Bucket inhauling load from 100-ft. depth.

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LUBE LOGIC

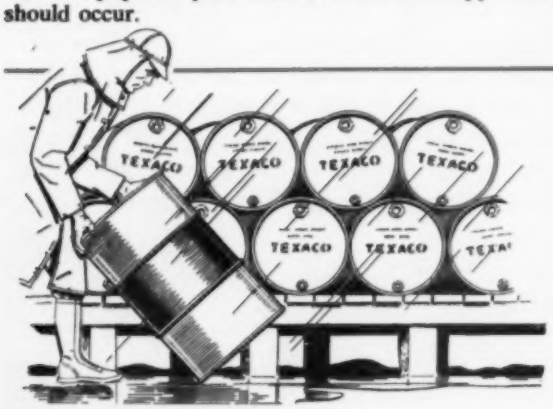
Six tips to

How high is your hidden cost of maintenance?

You may not realize how many extra maintenance dollars you spend when you keep many different lubricants on hand. (Six are often all you need to cover all major maintenance.) You pay extra for inventory. You pay extra for storage and handling. It costs you more in paperwork to order. And you'll have to figure the wasted cost of equipment parts and downtime if misapplication should occur.

The Texaco Lubrication Plan helps you reduce or even eliminate these hidden costs. That's because it provides the minimum number of *proven* multi-purpose and special lubricants, tailored to your job requirements.

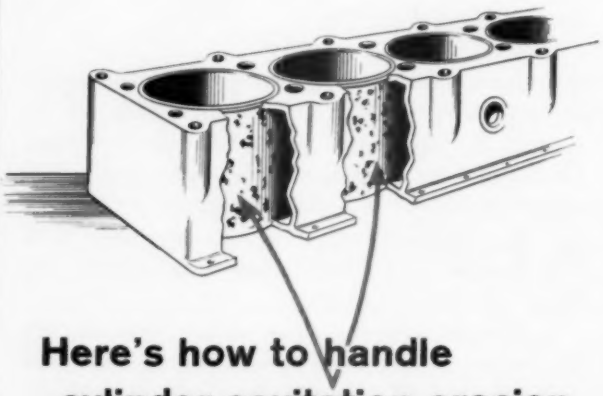
You'll do yourself a favor when you check with a Texaco Lubrication Engineer. He'll carefully plan your lubrication needs—then follow them up to see that your lubrication problems are taken care of fast.



The inside story on outside storage

You're short-changing yourself if you skip these simple precautions: drums stored outdoors should be placed on their sides. When stored on end, expansion and contraction through temperature changes can suck in rain water that collects on top of the drum.

Want to warm up lubricants that have become stiff from cold? *Don't* heat them with an open flame. You might melt the sealing compounds, and the drum will leak. You might also damage the product with too much heat in one spot. Put the drum indoors for a while before using.



Here's how to handle cylinder cavitation erosion

High pressure cooling systems in use in most supercharged diesels are subject to coolant aeration. This aeration can cause cavitation, leading to serious cylinder liner corrosion-erosion, unless a rust preventive is added to the water. A good antifreeze (like Texaco PT antifreeze) will do the job in winter—but in summer a 1% to 2% solution of Texaco Soluble Oil C will do a fine job. (Remember to flush out before you add antifreeze again.)

cut maintenance costs

OIL GAUGES SPEAK A LANGUAGE ALL THEIR OWN

Look to your oil gauge pressure for clues to a variety of potential engine ailments. For example:

LOW OR NONE

1. Oil pump pickup stuck high.

LOW

1. Clogged oil pump screen.
2. Excessive main, con-rod, camshaft or rocker-arm bearing clearances.
3. Clogged full-low filter, if by-pass isn't working.
4. Excessive dilution of oil with fuel.
5. Enlarged squirt holes.
6. Loose connections or cracks in oil line.

LOW OR ERRATIC

1. Faulty oil pump.
2. Restriction in oil pan, or oil too viscous to keep oil pump intake supplied.

LOW OR HIGH

1. Faulty gauge.
2. Ineffective oil cooler depending on type, may keep oil too cold or provide insufficient cooling.

HIGH

1. Oil with viscosity too high for climate.
2. Sludge and contamination in the oil.
3. Clogged oil passages on the pressure side.

HIGH, LOW OR ERRATIC

1. Improper setting or failure of pressure relief valve.

ERRATIC, LOW, THEN NONE

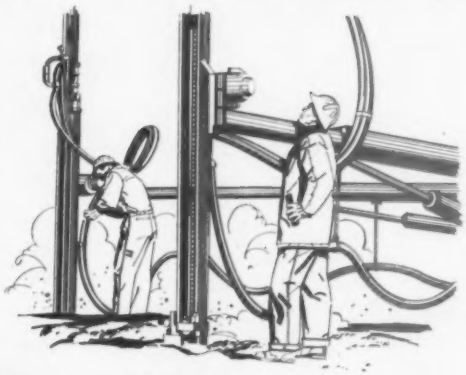
1. Crankcase oil level just at or below oil pump pickup.

NO MOVEMENT OR DELAYED ACTION

1. Clogged line to gauge.

Don't let engines foul up!

If the fuel injector on a diesel drifts off or "dribbles," incompletely burned fuel will contaminate the crankcase. The result will be plenty of smoke—and probably engine trouble. The injector should be fixed immediately—but if it can't be, start shortening drain periods to remove the damaging oil-fuel mixture. Also, use an oil with full detergent and dispersion properties to keep other undesirable products out of the engine.



New product for rock drill couplings

Actually, it's an old friend, Marfak Heavy Duty #2, in a new application. According to the raves from customers who've tried it, the lubricant works better on rock drill couplings than anything they've ever used.

TEXACO LUBRICATION ENGINEERS

Every month or so we'll bring you a batch of "sleepers"—little angles, so easy to overlook, where big savings in time and money can be made. But month in, month out, your local Texaco Lubrication Engineer is the best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

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TEXACO

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continued from page 26

Can an employe be fired for going to jail because he failed to support his wife?

What Happened: The company policy stated that employment "may be terminated if an employe is absent from work for 10 days or more without reasonable cause."

John X was having domestic troubles. He was being charged with non-support and was ordered to pay his wife $50.00 a week. When he failed to come across, he was sentenced to 90 days in the workhouse. The company dropped him from the payroll for being "absent from work for 10 days or more without reasonable cause."

When John got out of jail he showed up at the gate but was refused work. He grieved:

"I was not absent without 'reasonable cause.' I wanted to come to work but I couldn't because I was in jail."

The company answered: You could have stayed out of jail by paying the $50.00 a week. You chose not to do so and went to jail instead. This was your own doing. Therefore your absence was your own fault. You stay fired.

Was the company:
Right? ☐ **Wrong?** ☐

What Arbitrator Seward ruled: "Employes who are sent to jail present a problem. They have not turned their back on their obligations as employes. Their absence is not the result of a decision not to come to work. Typically, it is the result of some action on their part—unrelated to their obligations as employes—which has led society to step in and, by placing them in jail, prevent them from coming to work. This does not mean that they should not be considered responsible for their presence in jail. John X did not have reasonable cause for absence. The company has the right to discharge him."

Can a union president leave his work to discuss problems with employes?

What Happened: "The roving ambassador" was what management called union-president Jilling. He was always wandering around the plant talking to employes. He claimed this was part of his job—to discuss problems with union members. Further, he said this helped management because his talks helped straighten things out. When negotiations came up, the company insisted on a clause limiting Jilling's movements. The following clause was accepted:

> "The local President shall request permission to take reasonable time off for investigation and adjustment of grievances without loss of earnings. Such permission shall not arbitrarily be withheld."

One day Jilling came up to his foreman and asked for permission to leave his job. "What for?" his foreman asked.

"I've got to look into the workman's compensation claim of Bill Howell in the next department."

"Doesn't sound like a grievance to me. I'll check." And the foreman picked up the phone and called Howell's foreman. "There's no grievance there. You can handle it on your lunch hour," was the foreman's decision.

Jilling left his job and went to check into the matter. He was disciplined. At the arbitration he said:

1. My job is to investigate and adjust grievances. How do I know there's no grievance unless I go and look.
2. Grievance investigations should be made right away. Serious things may result from delay. This is for the company's benefit as well.

The company wasn't swayed by this approach:

1. Our contract limits the union president to grievance investigations. A workman's compensation problem is not a grievance.
2. If our foremen make a mistake and arbitrarily withhold permission, then the union president can use the grievance machinery. He can't just go off on his own.

Was the company:
Right? ☐ **Wrong?** ☐

What Arbitrator Duff ruled: "There was no immediacy about obtaining the information that Jilling sought. It could have been obtained during lunch hour, or at some other time so as not to interfere with his regular job duties. The supervisor did not act arbitrarily, and Jilling's leaving after being told not to was definitely in violation of the contract. Jilling was properly disciplined in this case."

Is a Xmas bonus a "gift" or a "wage"?

What Happened: Since 1950, Christmas time was "bonus time" to employes of this company. Workers with less than one year's service received $25.00 and those with greater seniority found larger sums in their envelopes. Last year business took a serious dive for the company and for the first time in many years it lost money. As a result, the Xmas bonus was eliminated. The union brought a grievance for the employes.

"You're cutting the wages," the union charged. Our contract says that there shall be no change in 'local working conditions' and the bonus has come to be accepted as regular pay. If we knew that this bonus was not a regular thing, we would have bargained for a higher wage rate. Besides, the employer knew that this bonus was a wage because he took out the withholding tax."

The company answered that the bonus was a gift. Otherwise, why wasn't it included in the union agreement? As for the withholding tax, let the union read the law. Cash gift is subject to taxes.

Was the company:
Right? ☐ **Wrong?** ☐

What Arbitrator Stashower ruled: "It is understandable that an employe who has received a Christmas bonus each year for several years would be disappointed at the discontinuance of such payment at the end of any year. It is further understandable that employes may arrive at a conclusion that such year-end compensation is part of the employe's earnings. But no matter how understandable this disappointment may be, it must be recognized that the company can be required to continue such payment only where there is a firm contractual obligation to do so. Where the payment made each year was merely a gratuity dependent upon the discretion and determination of management, there can be no obligation to continue the payments."

END

saves $1500 PER MONTH with orton crane and dropball

Study reveals 19.96% savings over conventional plugger and explosive method

In a series of exhaustive tests in an open pit operation, a large mining corporation has recently determined that the cost of breaking rock can be cut by over $18,000 per year with the use of an ORTON Crane operating a dropball.

The tests considered all expenditures including cost of equipment, labor and maintenance.

Intangibles such as reduced air consumption, plugger replacements, decreased shovel maintenance, less time loss at the crusher were *not* included in the tests. These factors are considered worth many more thousands of dollars.

ONE IMPORTANT POINT WAS OBVIOUS IN THE REPORT: *The ability of a compact, mobile crane to stand up under this shattering work, continuously, shift after shift with little or no maintenance or down time is a highly significant factor in these savings!*

For facts about this remarkable crane—or other units up to 250-ton capacity, write for brochure.

Note easy accessibility to diesel engine. ALL ORTON cranes have smooth, shock-free, Torque-Control fluid clutch, finger-tip, air-operated controls, anti-friction bearings throughout—and are also available in *completely hydraulic* models.

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CRANE AND SHOVEL CO.
608 S. Dearborn Street CHICAGO 5, ILLINOIS
THE MOST POWERFUL NAME IN CRANES

PEOPLE IN THE NEWS

William A. Brown, Jr.

Charles W. Ireland

William Brown heads Consumers Div. of Vulcan Materials Co.

WILLIAM A. BROWN, JR. has been named president of the Consumers Div. of Vulcan Materials Co., Chicago, Ill., after resigning as vice president of Stewart-Warner Corp. and general manager of the Alemite Div. Mr. Brown, who was also named executive vice president of Vulcan Materials Co., succeeds Charles W. Ireland, chairman of the board, who has relinquished the post of president.

John J. Gates, Buffalo, N.Y., building materials executive, has been appointed president of the new transportation division which has been set up to serve local Vulcan operations. William C. Schlegel, now in charge of the company's concrete division, will be vice president of the new division.

Raymond W. McCall, a civil engineer who was project manager on the St. Lawrence Seaway, has been named assistant to Clay Lambert, operating vice president of Consumers Div., and Foster N. Wells has been appointed manager of the newly created department of engineering services.

Missouri Limestone Producers Assoc. elects officers

ADOLPH ADRIAN, Adrian Materials Co., Jefferson City, Mo., was elected president of the Missouri Limestone Producers Association at the recent annual meeting in Jefferson City. E. L. Aussieker, Auxvasse Stone and Gravel Co., Mexico, was elected vice president, and W. E. Thomson, Jr., Dietz Hill Development Co., Kansas City, secretary-treasurer.

N. A. McDonald, Jefferson City, Mo., was named manager of the Association, succeeding Ralph J. Kalberloh, who has resigned to become managing director of the Missouri Safety Council. Mr. McDonald, who resigned as material damage supervisor of the Missouri Farm Bureau Federation, is a graduate of the University of Missouri with a BS degree in agriculture and forestry. He also attended Michigan State University.

The board of directors of the association was increased from nine to 11 members. New directors are: R. W. Cullor, Cullor Limestone Co., Ft. Scott, Kan.; N. J. Cooksey, N. J. Cooksey Co., Moberly; John Griesemer, Griesemer Stone Co., Springfield; I. L. Williams, Jr., Williams Rock Mining Co., Clinton; and Charles Hayes, L. W. Hayes, Inc., Bethaney.

Phoenix Cement Co. appointments

CHARLES W. FOX has been appointed operations manager for the Clarkdale, Ariz., plant of the Phoenix Div. of American Cement Corp. He was formerly project engineer at the plant. J. G. Van Meter, who has been serving as acting plant superintendent at Clarkdale, is now plant superintendent.

Midwest Research Institute names Dobbins as director

CRIS DOBBINS, president of Ideal Cement Co., Denver, Colo., has been elected a trustee of Midwest Research Institute, Kansas City, Mo. The group was founded in 1945 to solve research problems for private industry and the public and to give the small manufacturer research facilities equivalent to those of the largest corporation. Its board of 170 trustees includes industrialists, business executives and educators throughout the country.

Brickley appointed assistant sales manager

PAUL C. BRICKLEY has been promoted to assistant sales manager of Ash Grove Lime and Portland Cement Co. Since 1946, Mr. Brickley has represented the company in northwest Iowa.

(Continued on page 37)

BAG DAMAGE ENDS... *when you use multiwalls made of* CLUPAK* *extensible paper!*

NEW, TOUGHER KRAFT SOLVES BREAKAGE PROBLEMS

New CLUPAK extensible paper offers multiwall buyers a happy choice . . . Because CLUPAK extensible paper has a patented, built-in stretch and "give," it simply absorbs most shocks and strains that rip, split or tear conventional kraft. By specifying CLUPAK in your kraft bags, you solve your breakage problems once and for all. Multiwalls of CLUPAK fill faster, palletize better and handle easier. For special handling problems, CLUPAK can be supplied with a rough outer-sheet to provide far better anti-slide protection for your product.

Millions of these new multiwalls have proved the advantage of this tougher, stronger paper. Plan a trial shipment of multiwalls, made of CLUPAK, as part of your next bag order. See the difference for yourself. Your customers are sure to like the extra service of a better, more dependable bag . . . and so will you.

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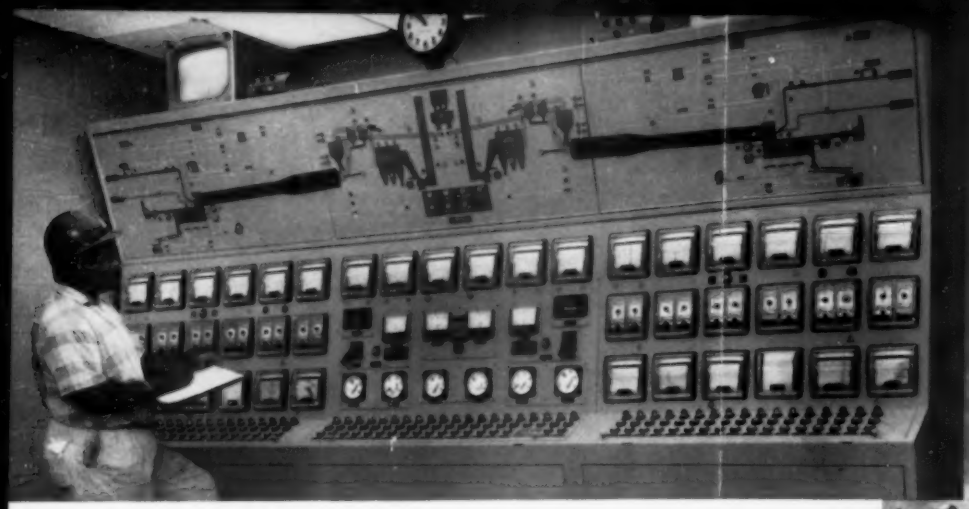


Riverside's computer-controlled plant now on-stream with Foxboro Electronic Consotrols

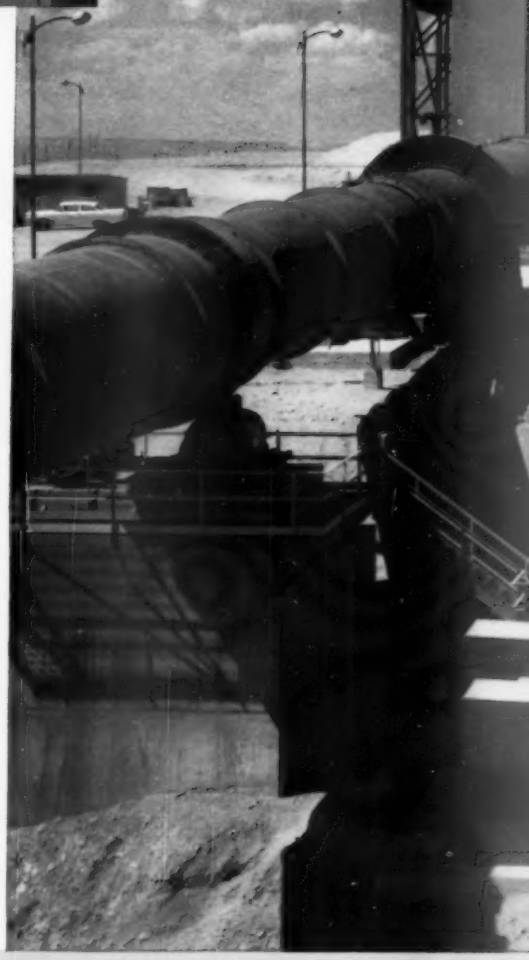
pressures — temperatures — flows all electronically controlled

Giant, gas-fired cement kilns, 310′ long, 10′ and 12′ in diameter — they're under complete Foxboro electronic control at Riverside Cement Company, Oro Grande, Calif. All process variables, including pressures, temperatures, motion, differential pressures, motor speeds, gas-analysis, and gas-air ratios are included in this fully co-ordinated instrument system.

Riverside's Electronic Consotrol* Instrumentation includes transmitters, controllers, recorders, converters, integrators, alarms — all solid-state — all linked by a common 10-50 ma, d-c signal. Transmission is over simple, unshielded lines. And this ultra-modern control system is fully compatible with process control computers.

Foxboro Electronic Consotrol Instrumentation is ideal wherever precise, rapid, long-distance control is required. Ask your local Foxboro Field Engineer about Electronic Consotrols — or write for Bulletin 21-10. The Foxboro Company, 8311 Neponset Avenue, Foxboro, Mass.

*Reg. U. S. Pat. Off.



AN ELECTRONIC CONSOTROL INSTRUMENT FOR EVERY CONTROL LOOP FUNCTION

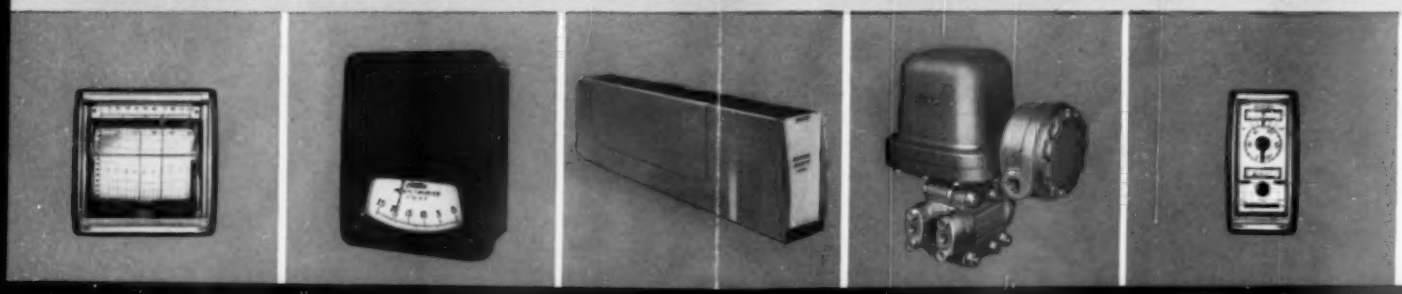
Recorders
No amplifiers, slidewires, or servo motors. Operate completely independent of controller. 1 and 2-pen models, with 4" vertical strip chart.

Indicating Transmitters
Use any standard Foxboro measuring element — continue to measure and indicate even in event of power failure.

Electrical Converters
Convert EMF and Resistance measurements to a 10-50 ma, d-c signal. Rack or panel mounted. No batteries, no slidewires, no servos.

2-wire Transmitters
For measurements such as pressure, absolute pressure, differential pressure, and level. Require no local power supply.

Indicating Controllers
May be mounted individually or in same housing with recorder. Each operates and pulls out from panel — completely independent of the other.



Typical application of Foxboro Electronic Consotrol Instrumentation . . . Riverside Cement Company's modern plant at Oro Grande, Calif. 310′ kilns have all process variables under Foxboro electronic control. Other major Foxboro electronic installations include petrochemical plants in the U. S. and Canada, nuclear reactors, as well as unattended booster stations on a 680-mile crude oil pipe line.

FOXBORO

REG. U.S. PAT. OFF.

(Continued from page 32)

PCA district engineer

ALAN C. CARTER has been named Salt Lake City district engineer for the Portland Cement Association, succeeding Ralph E. Spears, newly appointed regional structural engineer for the association's west central region.

Mr. Carter, formerly with the Bureau of Reclamation, has been a field engineer for the Salt Lake City office since 1953. He received the master's degree in civil engineering from the University of Utah.

Named manager for Huron at Alpena

CHARLES L. HOWLETT has been appointed manager of the Alpena mill of Huron Portland Cement Co. Howlett is a graduate of Antioch College, Yellow Springs, Ohio. He has been associated with Huron since 1945 and progressed through the engineering and operations department before being named assistant mill manager in 1958. He succeeds William G. MacDonald, who will remain as staff consultant.

PCA appoints two civil engineers

JAMES A. WILLIS and Arthur C. Beard have been appointed to the staff of civil engineers of the Portland Cement Association. Mr. Willis, who will work out of San Diego, will be the association's field representative in San Diego and Imperial counties. Mr. Beard will represent the association in Long Beach and Orange counties. Mr. Willis is an engineering graduate of Colorado State University, Ft. Collins, and of the University of California, Berkeley, where he received a master's degree in engineering. Mr. Beard, a civil engineering graduate from the University of Southern California, joins PCA following eight years service as a Naval construction officer.

Permanente Cement Co. names president

WALLACE A. MARSH is the newly appointed president and chief executive officer of the Permanente Cement Co. and its subsidiaries, including Kaiser Gypsum Co., where he began his career in 1937 as a sand and gravel salesman. Mr. Marsh, a former California state highway engineer, became general manager of Permanente in 1949 and two years later was elected vice president of the company.

Crowe is new manager of USG's Boston plant

GEORGE A. CROWE has been appointed works manager of United States Gypsum Company's Boston, Mass., plant. He succeeds J. W. Fidler, who has transferred to Chicago.

Mr. Crowe joined the firm in 1949 as mechanical engineer and held engineering posts until appointed works manager at Hillsborough, New Brunswick, Canada, in 1955. He is a graduate of Acadia University and Nova Scotia Technical College, Nova Scotia.

General Portland Cement appoints sales director

GEORGE C. CARDEN has been promoted from assistant sales director to sales director of the Signal Mountain Div. of General Portland Cement Co. in Chattanooga, Tenn.

Headlee made comptroller

CHARLES A. HEADLEE was appointed comptroller of the Universal Atlas Cement Division of U.S. Steel Corp. He succeeds Henry C. Schmielau, who retires as vice president and comptroller after 48 years with the division.

Mathews joins PCA staff

LAURENCE C. MATHEWS has joined the staff of the Portland Cement Association and will represent the association in Central Washington from headquarters in Yakima. Mr. Mathews, a graduate of the University of Washington, Seattle, is a registered civil engineer, a member of the Washington Society of Professional Engineers, the American Public Works Association and the Pacific Northwest Sewage and Industrial Wastes Assn.

Transportation director

C. W. SPANGENBERGER has been appointed director of transportation for New York Trap Rock Corp. Since 1954, he has held the post of president of Cornell Steamboat Co., which became a subsidiary of Trap Rock in 1958. He is a graduate of New York University and has been associated with the steamboat company since 1933.

Dixon named director of research and development

DR. J. K. DIXON has been appointed director of research and development for American Cyanamid Co., Industrial Chemicals Div., New York, N.Y. Dr. Dixon will direct research programs for the Industrial Chemicals Division's paper, refinery and process chemicals departments.

Fink cited for safety excellence

MATT F. FINK, Safety Director of Bestwall Gypsum Co. and Certain-teed Products Corp., was cited by the companies for establishing a safety record of more than 90 percent drop in injury frequency during his five-year program. END

DODGE HAS MORE PROVED BEARINGS THAN YOU HAVE BEARING PROBLEMS!

It pays to buy from a line of stock bearings—bearings that have been proved in thousands of installations similar to yours. You benefit by getting known dependability; and you get the important savings of high quality at production price.

PIN-POINT SELECTIVITY

Dodge has supplied mounted bearings to industry for over three-quarters of a century. Dodge bearings have always kept pace with improved production practices. Each new condition of service has been met by Dodge as it has arisen, with the result that the Dodge line contains mounted bearings to meet almost every service requirement with pin-point accuracy.

High load, high speed, excessive dust, moisture, corrosion, high or low temperatures, continuous operation—you name it!—such conditions and their combinations are met every day with Dodge bearings.

BROAD LINE—WIDELY DISTRIBUTED

In the great variety of mounted bearings developed by Dodge, you will most likely find the precise unit to fit your requirements ideally—without paying for features you do not need. And if your requirements call for several types of bearings, there is an advantage in having them of common design, such as Dodge offers.

The Dodge line is probably broader than any other line of mounted bearings in America. And of special importance to machinery manufacturers, it is the most widely distributed line. There is always a Dodge bearing of the right type and size near at hand.

You can check this with your local Dodge Distributor. Ask him—or write us for the Dodge Bearing Bulletin.

In addition to tapered roller, spherical roller and ball bearings, Dodge builds many types of sleeve bearings. Here is the "large and small" of the sleeve type bearings carried in stock—ranging from an 8-in. Sleevoil weighing over 1200 lbs. to a ½-in. solid journal bearing weighing 9 ounces.

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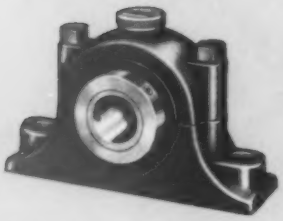
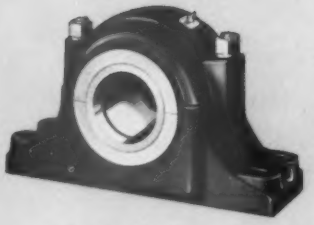
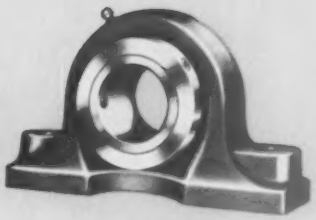


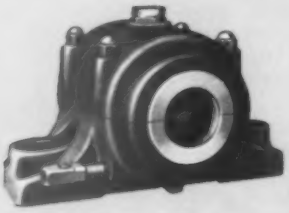
DODGE PILLOW BLOCKS WITH TIMKEN TAPERED ROLLER BEARINGS



DODGE SPHER-ALIGN PILLOW BLOCKS WITH SPHERICAL ROLLER BEARINGS

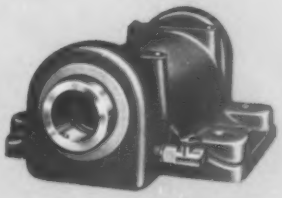


DODGE BALL BEARING PILLOW BLOCKS

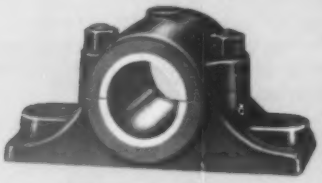


DODGE SLEEVOIL PILLOW BLOCKS

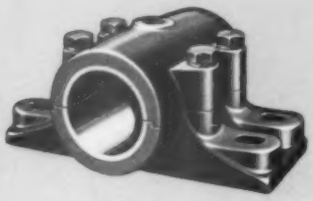
DODGE BRONZOIL PILLOW BLOCKS



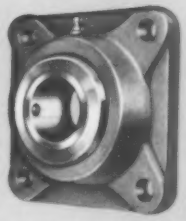
DODGE BRONZE BUSHED PILLOW BLOCKS



DODGE JOURNAL BEARINGS SOLID AND SPLIT



DODGE HEAVY RIGID PILLOW BLOCKS



FLANGE BEARINGS: HANGER BEARINGS: BEARING UNITS: TAKE-UPS

● **Dodge Pillow Blocks with Timken Tapered Roller Bearings.** America's quality pillow blocks. Assembled, lubricated, adjusted and sealed at the factory. 5 types for varying needs.

● **Dodge Spher-Align with Spherical Roller Bearings.** Rugged heavy duty, compact, inherently self-aligning. Exclusive Micro-Mount simplifies installation.

● **Dodge Ball Bearing Pillow Blocks.** Deep groove ball bearings with long inner races—high capacity. SL, SC and SCM models for light, normal and medium service respectively.

● **Dodge Sleevoil Pillow Blocks.** Ultra quality . . . extra long life . . . accessibility . . . *quiet*. Plain or water-cooled.

● **Dodge Bronzoil Pillow Blocks.** Efficient, low cost pillow blocks with self-oiling, capillary bronze bushings. Self-aligning. Large oil reservoirs.

● **Dodge Bronze Bushed Pillow Blocks.** Quiet fan and blower pillow blocks with two bronze bushings of high lead content mounted in one cast iron housing.

● **Dodge Journal Bearings — Solid and Split.** True running, dependable. Babbitted bearings with precision machined bores and faces. Finished bases.

● **Dodge Heavy Rigid Pillow Blocks.** Rugged, carefully bored, babbitted pillow blocks for many applications requiring grease lubrication. Finished bases and ends.

● **Bearing Units.** A wide variety—spherical seat, cartridge, flange, hanger, screw conveyor hanger, take-up. Ball, Roller and Sleeve types.

CALL THE TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look under "Dodge Transmissioneer" in the *white* pages of your telephone directory, or in the yellow pages under "Power Transmission Machinery."

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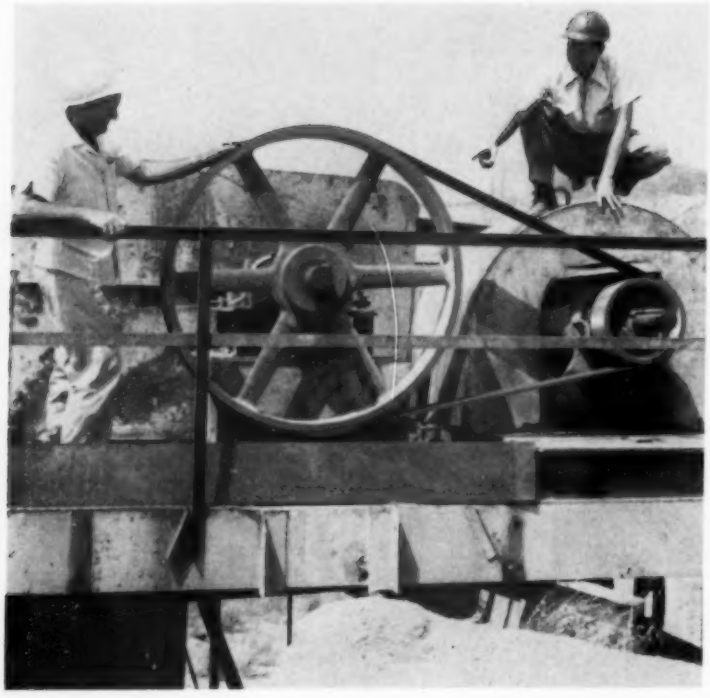
INDUSTRY NEWS



Good turn deserves another; producer compliments dealer

WHEN A PRODUCER TAKES TIME and space in a company publication to spotlight the services of a vendor, that is news. It happened when Consolidated Rock Products Co., Los Angeles, devoted a full page in Consolidated Rock News to praise a sales engineer for exceptional services. He is Bob Senft, pictured above, right, with Carl Hauser, superintendent of the firm's Sun Valley plant. They're discussing merits of a new V-belt drive on the No. 2 pit conveyor. Bob is employed by Bay City Bearing Co.

How does a sales engineer like Bob rate an accolade? By being on the job in an emergency and by consistently calling the attention of management to new developments and money-saving ideas. "Good Service Gets Job Done," proclaims the article that accompanied this photo. It acknowledges the "service and cooperation that makes short work of an otherwise costly down-time" and expresses appreciation for "the cooperation of our many vendors and their efforts to render special services."

Schundler operations split between two J-M divisions

JOHNS-MANVILLE CORP., New York, N.Y., has divided the perlite mining, milling and manufacturing facilities of F. E. Schundler & Co. between its Celite and Building Products Divisions. The Joliet, Ill., firm was acquired by J-M in September 1959.

The Celite Div. will operate the perlite ore deposit and mill near No Agua, N.M.; facilities for storage, blending and loading perlite at Antonito, Colo., and one perlite plant at Joliet where nonmetallic minerals—perlite, limestone and clays—are expanded, screened and ground.

The Building Products Div. has responsibility for the Schundler Rockdale plant near Joliet where Fesco board, a noncombustible industrial roof insulation containing perlite, is produced. This brings to 14 the number of the Building Products Div.'s plants in the United States.

Two former employes of the Schundler Co., Lyle Bolster and Kirk Hazelton, were appointed to newly created posts in the Celite Div. Mr. Bolster will be responsible for sale of crude perlite ore to gypsum companies and perlite expanding plants throughout the United States. Mr. Hazelton will be responsible for providing technical help in processing ore for expanded products.

Louisiana Geological Survey confirms rich bentonite find

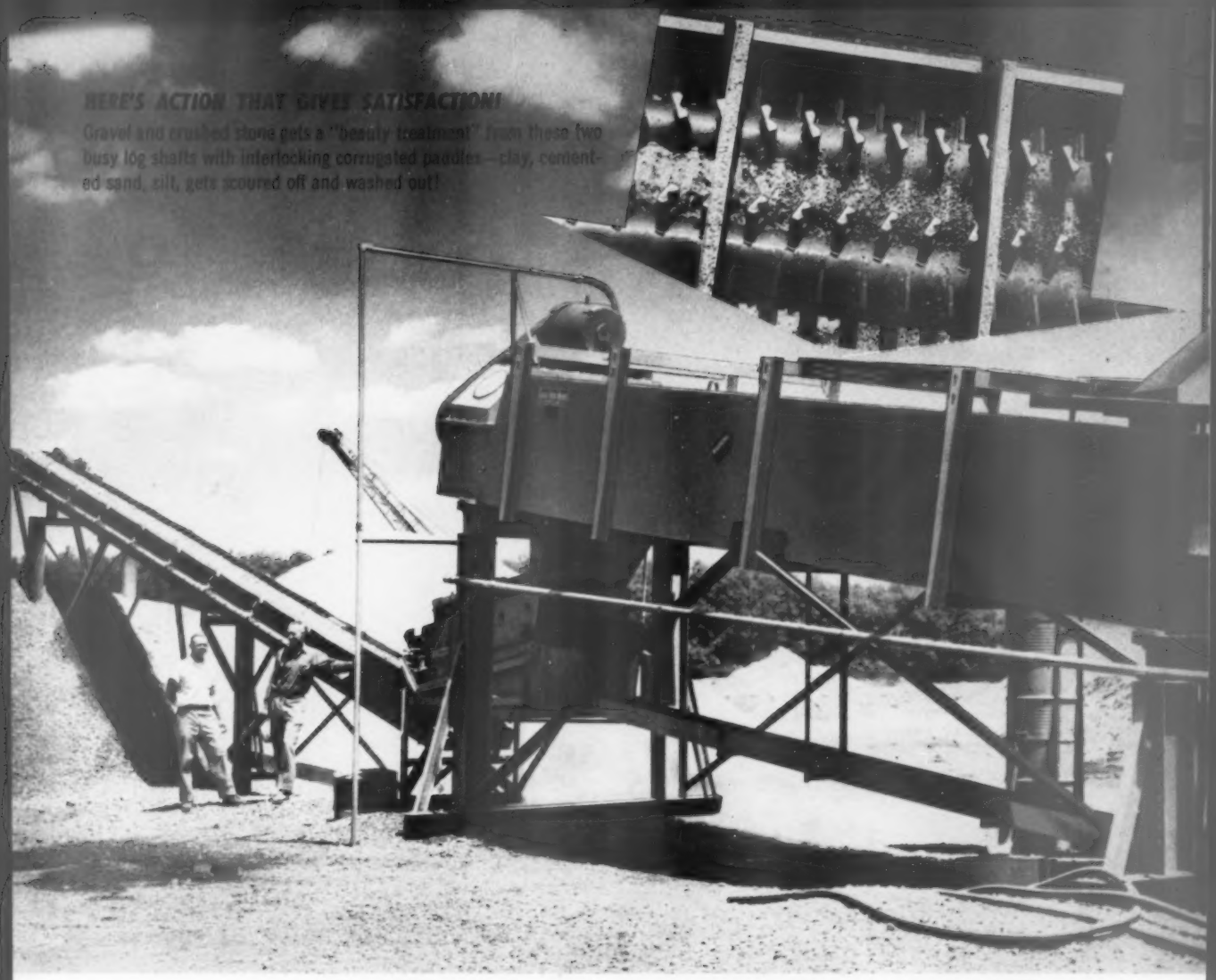
LEO W. HOUGH, state geologist, said that a deposit of bentonite estimated at more than 700,000 tons has been discovered near Homer, La. Mr. Hough said the deposit is more than 2 ft. thick in a 72-acre area, and 10-ft. thick in 6 acres.

"This thickness combined with a maximum overburden of 25 to 30 ft. makes it the largest and most accessible deposit so far known in Louisiana and probably in the Gulf South," said Mr. Hough.

Crush oyster shells

A NEW ENTERPRISE in Bainbridge, Ga., is an oyster-shell crushing company operated by Albert Weir of Athens, Ga. The plant started up early this year. Shells are received by barge; initial orders for part of the output were received from poultry producers in the Southeast.

(Continued on page 44)



"Since buying our Eagle Log Washer

WE HAVE NOT SEEN A CLAY BALL IN OUR PRODUCT"

Walling Gravel Co., St. Johns, Mich.

There's just no better way to wash gravel or crushed stone than with an Eagle Log Washer—we have the word of users all over north America. The Walling brothers, Bert and Bob (pictured above) are typical. They report that an Eagle Log Washer solved their problem—all clay balls removed from their gravel.

The Eagle Log Washer is way ahead in design, based on Eagle's years of experience—non-deflecting tubular steel log shafts which turn without wear common to square shafts have bolted flange stub shafts that allow easy removal—paddles with two-piece wear resistant, corrugated shoes which permit top half of shoe to be replaced when worn instead of replacing entire shoe—water lubricated marine type bearings at lower end of tub (no problems from contaminated grease)—totally enclosed compound gear drive runs in an oil bath. No wonder that Eagle Log Washers are performing so well for so many users. See why—send for Catalog 58.

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EAGLE IRON WORKS

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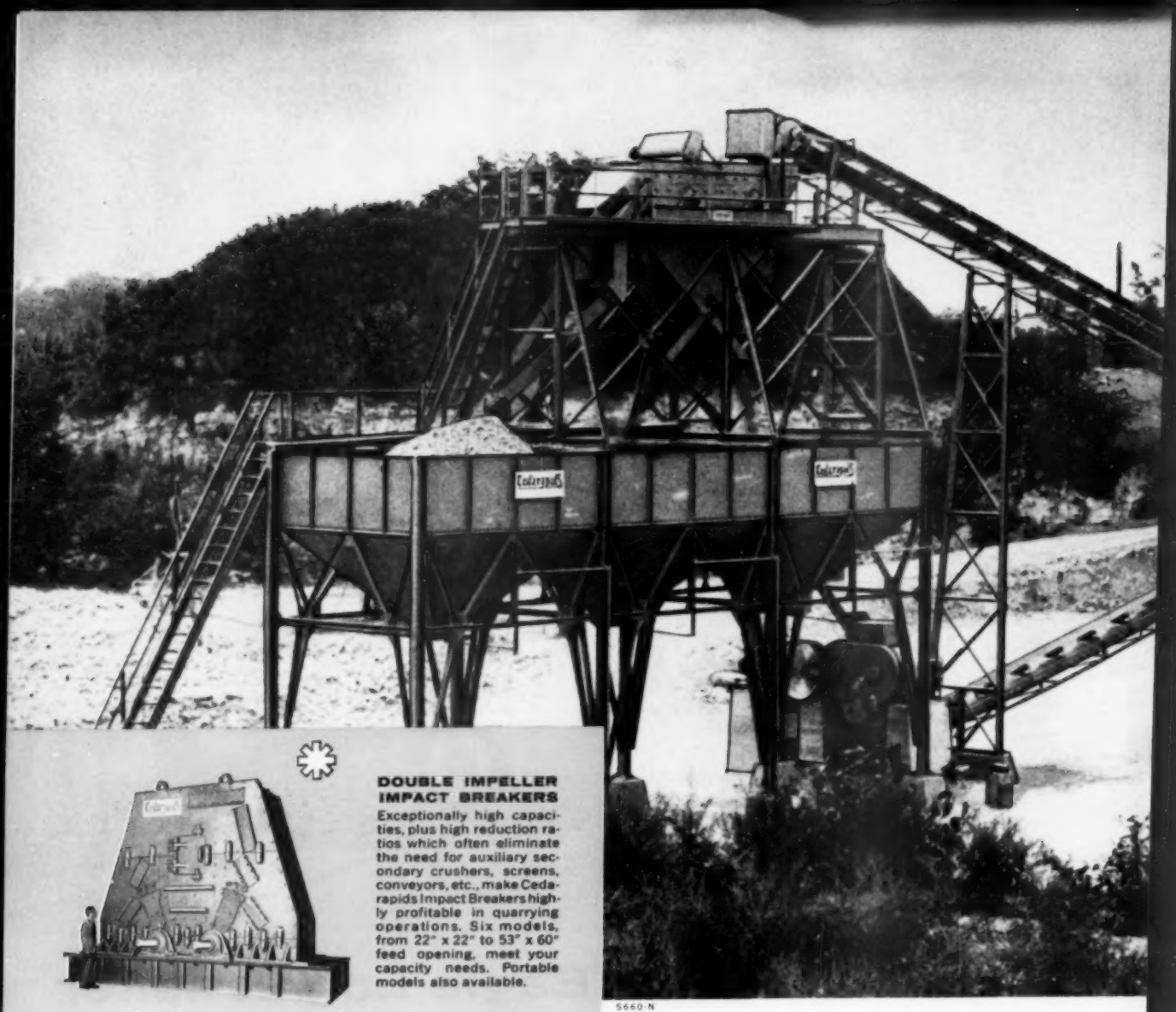
Factory-Trained Distributors *Everywhere*

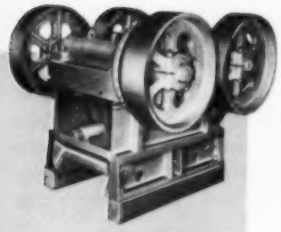


DOUBLE IMPELLER IMPACT BREAKERS

Exceptionally high capacities, plus high reduction ratios which often eliminate the need for auxiliary secondary crushers, screens, conveyors, etc., make Cedarapids Impact Breakers highly profitable in quarrying operations. Six models, from 22" x 22" to 53" x 60" feed opening, meet your capacity needs. Portable models also available.

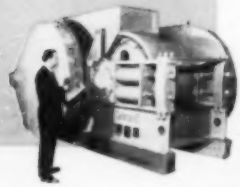
S660-N

Production-balanced components—
CEDARAPIDS ENGINEERED FOR LOWEST COST PER TON



TWIN-JAW CRUSHERS

An exclusive Cedarapids design! Two movable synchronized jaws, operating at high speed, give you 40% to 100% greater primary crushing capacity than single-jaw crushers of comparable size. 5 to 10 times longer jaw life cuts maintenance. Available in three sizes. Single-jaw crushers also offered in 13 sizes.



ROLL CRUSHERS

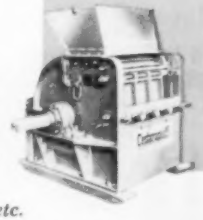
Where high capacities of the crushed products are required, Cedarapids roll crushers are ideal units for secondary reduction. Six model sizes to meet volume demands and balance primary production.

HORIZONTAL VIBRATING SCREENS

Fast, snappy action, with no soft, cushioning effect. Horizontal cloth openings permit more of the correct size material to go through, yielding 30% greater capacity than same-size inclined screens. Sizes: 3' x 8' to 60" x 16', double and triple deck.

HAMMERMILLS

Exclusive Cedarapids Hammermill features produce a much finer quality of product, and size for size, produce more tons per hour than other similar types of equipment. 4 sizes available.



Plus feeders, conveyors, vibrating grizzlies, washing plants, bins, etc.

Beat rising costs with a CEDARAPIDS ENGINEERED STATIONARY PLANT

In the face of rapidly rising operating costs and growing competition, there's one good way to get out of the slim-profit strait jacket. Call in Cedarapids Engineers to "tailor" a stationary plant to your specific needs.

Cedarapids Engineers will give you a sound evaluation of your raw material, job site and operating conditions, and your potential market. They will incorporate the newest developments in equipment and the latest technical improvements in plant engineering. You'll benefit with an *engineered* plant, cleanly designed with the minimum number of the proper type of components to give you the desired capacity of improved, specification products . . . and with the maintenance and operating economies that assure lowest cost per ton.

Your Cedarapids Dealer will show you how to take advantage of this cost saving, time saving, one-company service. Or write direct to Cedarapids Special Plants Engineering Department.

IOWA MANUFACTURING COMPANY

CEDAR RAPIDS, IOWA

Please send full information about:

☐ Cedarapids Stationary Plant Engineering Service

☐ Components_____ (specify type) ☐ Portable Aggregate Plants

☐ Bituminous Pavers ☐ Bituminous Mixing Plants

Name_____

Company_____

Address_____

City_____ State_____

(Continued from page 40)

ACL kiln at Dow Chemical to process lime

A NEW KILN being installed at the Ludington (Mich.) Division of Dow Chemical Co. will almost double its present lime-producing capacity. Believed by the company to be the world's largest-capacity lime kiln, it is designed to produce 600 tpd.

Louis N. Carmouche, manager of the Ludington Division, said the new kiln is the first of the Allis-Chalmers-Lellep type grate kilns devoted to the production of lime in the United States. Several of these kilns, however, have been built for cement.

The new kiln will be erected by Allis-Chalmers Manufacturing Co. adjacent to the two existing kilns. It will be 11.5 x 160 ft. When completed, about August 15, 1960, it and the other kilns will be serviced by a new 200-ft.-high smokestack that will replace present stacks.

Nevada mines director urges mining uses of public land

"UNTIL THE DAY when we can say we have completely explored our country, all public land should be left open to mineral entry." This was the message of Vernon E. Scheid when he testified before the Subcommittee on Public Lands of the Senate Committee on Interior and Insular Affairs in regard to establishment of a Great Basin National Park in Nevada.

Mr. Scheid is director of the Nevada Bureau of Mines and dean of the Mackay School of Mines at the University of Nevada. He inferred that if such a park were established, its use should not be restricted to recreation, as has been done in the past.

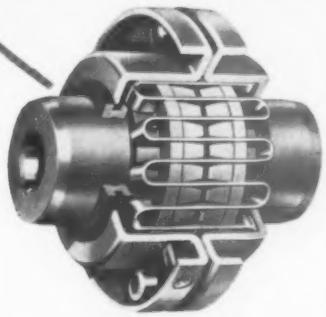
It is possible," commented Mr. Scheid, that certain of the natural resources of the presently established national parks should now be made available to our people; particularly if they are a natural resource not available elsewhere in our country."

He used the U. S. Forest Service as an example of wise administration of lands. On these lands we have multiple uses of natural resources . . . tree harvesting, grazing, recreation and mineral production.

Mr. Scheid recalled to memories of subcommittee members a happening of a few years ago. The U. S. Navy Department proposed to withdraw

(Continued on page 48)

Photo shows portable pump unit connected to internal combustion engine by a Type F FALK Steelflex Coupling



How FALK STEELFLEX Couplings give your connected machinery Double Protection

FIRST: *They protect against shaft misalignment.* Some degree of shaft misalignment is unavoidable—and unless protective compensation is provided, additional loads are developed on shafts, bearings and other revolving elements. The result is excessive wear-and-tear—and often actual breakage....FALK Steelflex Couplings compensate for either angular or parallel misalignment—*or for the more serious condition involving both!* The exclusive Steelflex gridmember which joins the two hubs is not fastened to either hub; thus, either hub can shift in any direction without imposing a load on the other hub.

Yet, important as protection against shaft misalignment is to you, it is only one function of the *truly flexible* FALK Steelflex Coupling.

SECOND: *They protect against torque fluctuations* which create excess wear on connected machines and frequently induce destructive shaft misalignment. The exclusive FALK Steelflex grid-groove design cushions shock loads, dampens vibration, reduces impact loads as much as 30 per cent. You get this extra margin of protection that *can mean the difference between operating and breakdown!* You save on maintenance costs. And —you prolong the service life of your machines!...For complete information, ask your FALK Representative or Authorized Distributor. Or—**write direct for Bulletin 4100.**

FALK and STEELFLEX are Registered Trademarks

THE FALK CORPORATION, MILWAUKEE 1, WISCONSIN

Representatives and Distributors in Most Principal Cities

Manufacturers of Quality Gear Drives and Flexible Shaft Couplings

Basic Type F FALK STEELFLEX COUPLING fills the needs of 90% of industrial applications

This cutaway view shows the exclusive Steelflex design which provides *torsional resilience with the strength of steel.* This torsional resilience spreads peak or shock loads over a relatively long increment of time, thus *greatly reducing stresses* in connected machinery.

The versatile Type F Steelflex can be used horizontally or vertically, without modification or special parts. It is ideally suited to 9 out of 10 applications. For unusual applications involving overload conditions, extended shafts, brakes, etc., standard designs of dual-purpose Steelflex couplings are available.

For most applications, you can give your machines the extra protection afforded by FALK Steelflex Couplings at no extra cost!

FALK

...a good name in industry

Many design features contribute to H-120's superior balance, stability and load carrying capacity. Low, level bucket position minimizes spillage in travel, promotes operator safety and fullest visibility.

New H-120 PAYLOADER®

Big tractor-shovel cuts operating costs and improves plant efficiency for

VALLEY SAND & GRAVEL CORP.

Long reach (3½-ft. ahead of front tires) and high lift (14½-ft. under hinge pin) let the H-120 heap-load trucks and bins, build higher stockpiles.

Enter 1243 on Reader Card

Loads 21-Ton Trucks In 2 Minutes

The Scottsville, N.Y. plant of Valley Sand & Gravel Corp., is a busy operation producing sand and gravel, washed and graded to specification sizes. Material handling in the plant involves moving wet, washed sand from the conveyor drop area to drying out stockpiles, and the loading of trucks with all types of aggregate. About 400 tons of material per hour are handled in these phases of the operation.

In order to improve plant operating efficiency and speed truck loading a big H-120 "PAYLOADER" was purchased last July. It now hauls all the wet sand to drying out stockpiles and in addition loads trucks from various stockpiles.

REPLACES CLAMSHELL CRANES

Formerly trucks were loaded with 2 clamshell cranes, one at each stockpile, but now one operator and the "PAYLOADER" load big 21 ton trucks with 3 passes, in about 2 minutes. Its speed and maneuverability enable it to service *both* stockpiles, trucks are never delayed, and in addition the full volume of wet sand is hauled to the dry-out stockpiles.

Valley Sand & Gravel Corp. officials are naturally well pleased with the greatly improved plant efficiency and the "PAYLOADER" operator likes the ease of operation, speed and splendid visibility of the bucket in every position.

This is just one of the many plants throughout the country in which this big H-120 "PAYLOADER" is cutting costs, speeding operations and increasing output. It will pay you, also, to check your plant . . . chances are a "PAYLOADER" of the proper size can effect important savings and increase your plant efficiency substantially. There are 8 "PAYLOADER" sizes to fit any plant requirement. Contact your HOUGH distributor or return the coupon for more information.

HOUGH, PAYLOADER, PAYMOVER, PAYLOGGER and PAY are registered trademark names of The Frank G. Hough Co., Libertyville, Ill.

The H-120 "PAYLOADER" gets full bucket loads of washed sand with its powerful traction and tremendous break-out force. Bucket tips back 40° at ground level.

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
705 Sunnyside Ave., Libertyville, Ill.

☐ Send data on Model H-120 "PAYLOADER"
☐ Send data on smaller "PAYLOADER" sizes

Name _____
Title _____
Company _____
Street _____
City _____ State _____

3-B-5

Enter 1244 on Reader Card

(Continued from page 44)

large areas of land in northern Nevada for military use. A condition of the withdrawal of these lands was to stop mineral entry. Since that time the Eagle-Picher Co. has discovered and developed a large deposit of diatomite within the areas originally requested by the Navy. On the basis of this deposit, the company has built a modern industrial plant at Lovelock, Nev., which supplies high-grade diatomite filters to the chemical and pharmaceutical industries. "This discovery," he emphasized, "was on land that was to be withdrawn from all future mineral entry!"

Mexico views low-grade phosphate for fertilizer

MEXICO'S MINING DEVELOPMENT COMMISSION is building a $1-million upgrading plant at Saltillo to render Coahuila State's 25-million-ton deposit of low- grade phosphate rock amenable to fertilizer and animal-feed manufacture. Chemical Engineering (October 19, 1959) commented that Mexico is hopeful to use its own reserves, avoiding the $7-million yearly expenditure for 50,000 tons of Florida rock.

The plant under construction will upgrade 40,000 tpy. of 18 to 20 percent P_2O_5 rock to 28 to 30 percent, suitable for nitric or sulfuric acid processing into calcium phosphate fertilizers and feed. Mexico has experimented with a process in a 25-tpd. pilot plant that reduces the calcium carbonate to oxide by calcination, then hydrates the oxide and hydraulically or pneumatically separates the hydroxide formed.

Virginia-Carolina employes benefit in stock purchases

VIRGINIA-CAROLINA CHEMICAL CORP., Richmond, Va., has instituted a new internal stock purchase plan under which it gives employes one share of its common stock for every two they buy. This plan, going into effect January 1, 1960, is designed to encourage employes to share in the ownership of the company and to strengthen their financial security.

The plan is voluntary and employes may invest as much as 10 percent of their base pay or as little as $3 per month. Those with the company 18

(Continued on page 52)

THREE CAT DW21-PR21s *climb 8% grades with 31 tons of clay and limestone*

...and new DW20 and DW21 Series G Tractors have more muscle for even better performance

At Brandon, Miss., Marquette Cement Manufacturing Co. keeps three Cat DW21s with Athey PR21 wagons busy hauling clay and limestone to crushers. They climb 8 per cent grades on the 2000-foot haul with big 31-ton loads.

Good performance, but new Cat DW20 and DW21 Series G Tractors can boost this. With greater rimpull, higher speeds and stronger components, these new tractors with either wagons or new larger scrapers can better their predecessors on just about any job you've got for them to do. Better performance means just one thing . . . more profit for you.

Both the DW20 and DW21 put 345 HP (max. output) to work. There's 12 per cent more rimpull to give you as much as 20 per cent faster travel speeds under similar haul road conditions, compared to former models. Both tractors have stronger final drive gears and improved transmission shifter forks.

See your Caterpillar Dealer for a chance to operate the new DW20 or DW21 Series G with SynchroTouch Transmission Control—the advanced new way to shift gears easier and faster. Your operators just dial the gear for automatic, split-second response. This optional control makes it easy to choose the right gear for maximum efficiency.

Get to see and try these new tractors at your Caterpillar Dealer's soon. Before you do, think of the toughest test you can for them. Then, when the day comes, see if they don't beat your expectations . . . and then some.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.

CATERPILLAR

BORN OF RESEARCH
PROVED IN THE FIELD

Portable Lima Austin-Western 101-SE crushing plant spews pit-run stone and gravel into mobile surge bin.

Lima A-W Portable Crushers deliver

RELIABLE HIGH OUTPUT!

Designed and built for high output under *rugged* operating conditions, this portable Lima Austin-Western crushing plant is *ready* to pick up and go on a moment's notice. It belongs to the Williams Brothers Asphalt Paving Company, Ionia, Mich.

Reduced tonnage costs

They say, "It's a reliable high-output mobile rig that's been doing a very dependable job for us in widely separated locations throughout southern Michigan.

"It's not a complicated piece of equipment. Only minimum maintenance has been required. It's easy to adjust to meet a wide range of rigid specifications in pit or quarry work. We find that the outfit's one man, central control also helps us to reduce costs per ton."

The 101-SE is a completely portable, self-contained unit designed and built for rapid transport from job to job. High-speed production of construction materials near the job greatly reduces hauling time and costs.

Maintenance reduced

Diesel power operates crushers and electric generator; all other operations are electric. Simplicity of transmission eliminates troublesome clutches, chains, sprockets and gearboxes . . . reduces maintenance, increases tonnage profits.

There's a portable or stationary Lima Austin-Western crushing and screening plant just right for your needs. Investigate—see your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

Stationary installation—Lima A-W line includes jaw and roll crushers, matching screens, elevators, conveyors and bins.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA AUSTIN-WESTERN Crushing, Screening and Washing Equipment

BALDWIN · LIMA · HAMILTON

CONSTRUCTION EQUIPMENT DIVISION • LIMA, OHIO

6015

Enter 1235 on Reader Card

Enter 1236 on Reader Card

LIMA

Fast, economical way to scoop...

Swing and load bulk materials; no waste motion!

New 5-yd. Lima Loader works at high speed standing still

The Lima loader digs, scoops, swings and loads in a complete circle at full speed from a stationary location. It is designed to give you top loader production with shovel efficiency.

The loader is actually five machines in one! Mounted on basic Type 64 crawler base, it is easily converted in the field to crane, shovel, dragline or pull shovel. Its 5-yd. bucket also serves as excavator or materials handler.

From removable bucket teeth to crawler treads, the new 5-yd. Lima Loader is a quality machine, built to give years of dependable high production with low maintenance requirements. If you handle gravel, stone, coal, dirt, chemicals or other bulk materials in your operations, a Lima loader will do the job faster and more economically than other conventional loading equipment.

Why not look into the advantages of a Lima Loader? Your nearby Lima distributor has interesting facts and figures for you. Call on him, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corp., Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio

BALDWIN · LIMA · HAMILTON 6020

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

BALDWIN BLH LIMA-HAMILTON

(Continued from page 48)

months or longer are eligible, but union consent is needed before union-represented employes can enroll. There has been widespread union acceptance of the idea.

Under the plan, V-C employes may choose one of two programs: Stock Savings or Stock Retirement. Under Stock Savings, an employe begins to receive certificates for all stock purchased for his account at the end of the second year following the plan year in which he entered the program.

For example, employes who enrolled January 1, 1960 would receive their first stock certificates after December 31, 1962. This is because the stock bought in 1960 has to be "vested" during 1961 and 1962 under Internal Revenue Service rules.

Under Stock Retirement the employe, after the two-year vesting period, would receive only those shares purchased with his own money. Shares bought for him with company contributions would be held in trust until his retirement, death or departure from the company. Virginia-Carolina guarantees employes against loss during the two-year vesting period. Outright cash payments will make up any difference between the value of stock and employes' contributions.

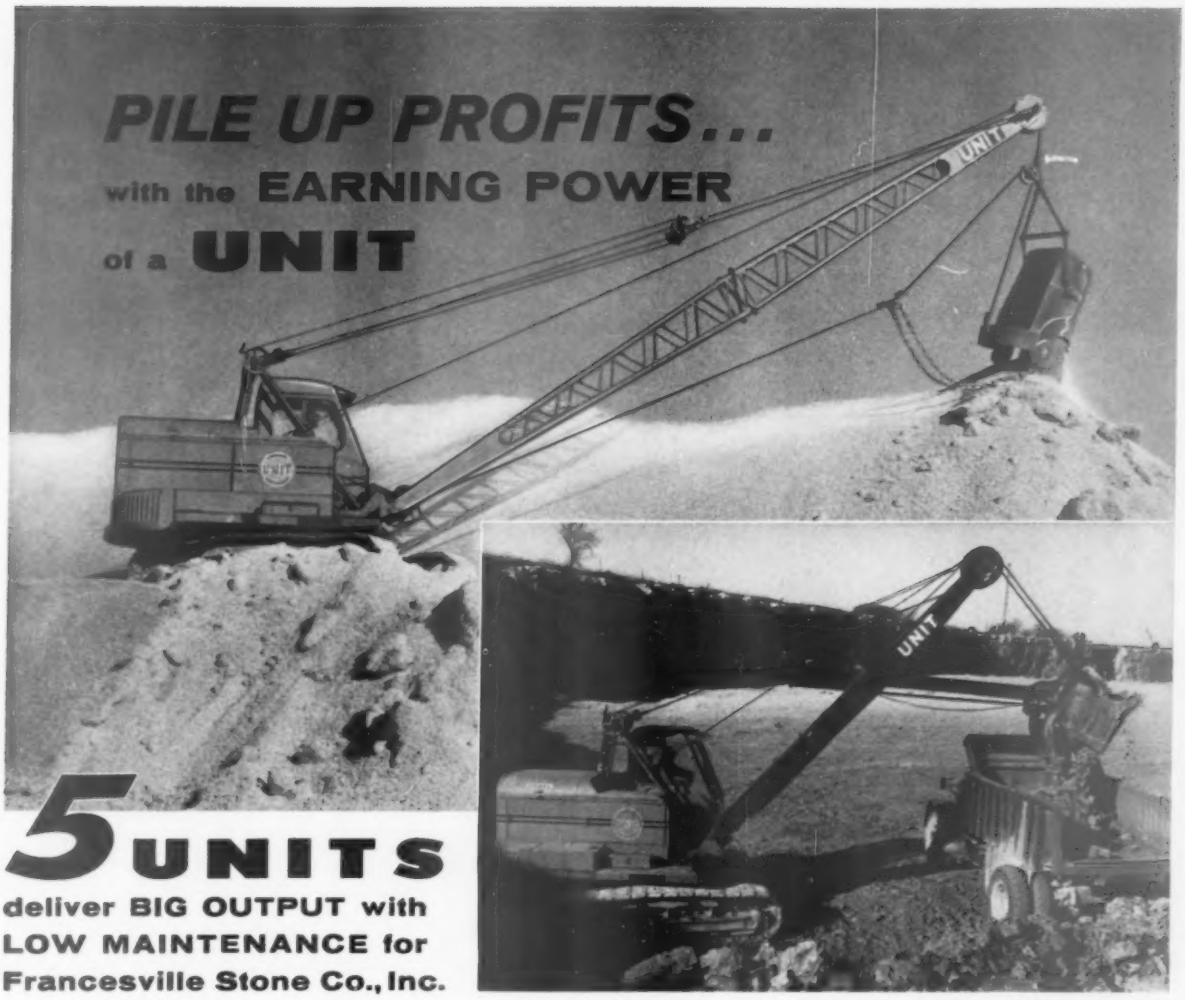
Ideal will "check pulse" before new commitments

IDEAL CEMENT CO., Denver, Colo., which had announced its intention to build a new plant in Washington, will proceed slowly in that direction, said Cris Dobbins, president. "It is our intention during 1960 to complete the work presently committed and get a better feel of the economic pulse," he said, "before proceeding on additional expansion either in Washington or at other locations this year even though commitments have been made."

(Mr. Dobbins later was quoted by the Journal of Commerce as saying Ideal would spend $17 million this year to complete expansion moves now under way. These include a second kiln at Tijeras, N.M.; shipping and storage facilities at Devil's Slide, Utah, and, finally, a Columbia River terminal.)

Mr. Dobbins made a year-end statement analyzing the company's status and industry conditions. "Probably one of the most significant developments in the cement industry recent-

(Continued on page 54)



5 UNITS

deliver BIG OUTPUT with LOW MAINTENANCE for Francesville Stone Co., Inc.

Francesville Stone Co., Inc., Francesville, Indiana is one of the more important producers of agstone, limestone and crushed rock in the area, and has an enviable reputation for prompt, efficient service in every phase of its operations.

A major factor is its fleet of 5 UNIT machines — 2 shovels, 2 draglines, and one Model 1520 on rubber tires, self-propelled, with clamshell bucket, which keep its plant running at top speed. The two shovels load out all the blasted rock in the quarry — the draglines handle stripping prior to blasting and also stockpiling at the plant. The 1520 self-propelled Clamshell is used to load trucks from stockpiles.

Francesville Stone Co. has depended upon UNIT machines for many years dating back to 1946 when it purchased its first UNIT shovel. The splendid performance of their first UNIT led to the purchase of 4 additional machines as their operations grew.

Big factors in their selection, in addition to their exceptional productivity, were the LOW MAINTENANCE costs and DEPENDABILITY in extremely rugged quarry work . . . and this means MORE EARNING POWER and profit, too.

You, too, can pile up profits with the earning power of a UNIT . . . built in ½, ⅝ and ¾ yard sizes, on crawler and rubber, fully convertible to all attachments.

UNIT

UNIT CRANE & SHOVEL CORP.

6409 W. Burnham Street
Milwaukee 19, Wisconsin

Enter 1237 on Reader Card

(Continued from page 52)

ly," he remarked, "is the tendency toward amalgamation of allied lines with cement production. There have been recent instances of ready-mixed concrete companies buying or building cement plants; or cement companies buying or building ready-mixed concrete and concrete products plants; and companies in other lines of building materials adding cement production to their activities.

"Thus, for the first time on a significant scale, the cement industry as a wholly separate entity seems to be undergoing a change, the effects of which could be quite far-reaching."

Cement industry expansions paced by Giant Portland

AN IMPRESSIVE $4-MILLION PROJECT announced by Giant Portland Cement Co. is in the forefront of cement industry expansion news. The company has begun construction of a fourth kiln and additional storage and shipping facilities at its Harleyville, S. C., plant. Plant capacity will go from 2.9 to 4 million bbl. per year.

The Harleyville plant already has been enlarged twice since it was built in 1948. There is no present shortage of supply, said J. D. Wilson, president, but the company is basing its expansion on its confidence in the continuing growth and development of the Carolinas.

Huron Portland Cement Co. expects to enlarge its fleet of cement carriers on the Great Lakes. It has taken an option on an oil tanker that has been carrying petroleum between the Gulf of Mexico and the East Coast. It could be converted to transport cement. The tanker is powered by a 4,000-hp. steam turbine engine, has a 68-ft. beam and 37-ft. depth.

Alpha Portland Cement Co. has a $5-million expansion budget for 1960, the start of a seven-year, $58-million program. Said Robert Gerstell, president, "We're not sure we can get that much money to spend but we're setting our sights high." One of the first projects will be to install Strong-Scott coal mills for pulverizing coal at Martins Creek, Pa. And there will be new silos at Catskill, N.Y., and LaSalle, Ill. As far as a new plant in concerned, Mr. Gerstell commented, "I've got a site in mind which looks pretty good but we haven't critically surveyed it yet."

(Continued on page 58)

The new Bucyrus-Erie 30-R Rotary Blast Hole Drill gives you more feet of hole per dollar invested than any other drill in its class . . . and isn't that what you *really* want from a drill?

WHAT MAKES IT SO GOOD?

It comes naturally. The 30-R is patterned after two of the most popular and productive rotary blast hole drills in the business — the famous Bucyrus-Erie 40-R and 50-R. Its performance advantages include 30,000 lb pulldown force . . . continuous drilling for 21 feet, 3 inches before adding new pipe . . . infinite selection of speeds from 0 to 100 rpm . . . instant stabilizing and leveling with three hydraulic jacks . . . *plus* stamina that just won't quit.

Let your Bucyrus-Erie distributor show you many other reasons why the new 30-R is so good, or write Bucyrus-Erie Company, Dept. 1B60, South Milwaukee, Wisconsin, for descriptive literature.

BUCYRUS ERIE®

MOST RESPECTED NAME IN THE INDUSTRY

How granite-bucking TD-20 wins tough quarry job!

—for Superior Stone Company, Crabtree Creek Quarry, Raleigh, North Carolina

Main reason why it's a TD-20 instead of some competitive rig: the more powerful, stronger-built "20" replaces a past model International TD-18—that set a stand-out record of high availability and low upkeep at this quarry!

The "20" is key equipment in helping feed the 200-ton-per-hour capacity crushing plant at Crabtree Creek Quarry of Superior Stone Company (Division of American Marietta Company).

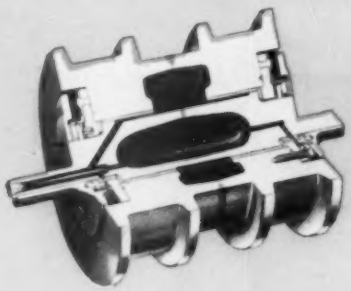
Slamming hard, heavy granite stone around is a main item on this International TD-20's work diet. That and tough over-burden removal, and haul-road maintenance!

"Rock-Bossing" power and strength

The TD-20's engine is a high-torque 134-hp diesel—with 6-cylinder smoothness and International diesel starting ease and economy. Bridge-strong track frames of heavy-duty, gusset-braced, welded box sections form the TD-20's rock-shock-resistant undercarriage.

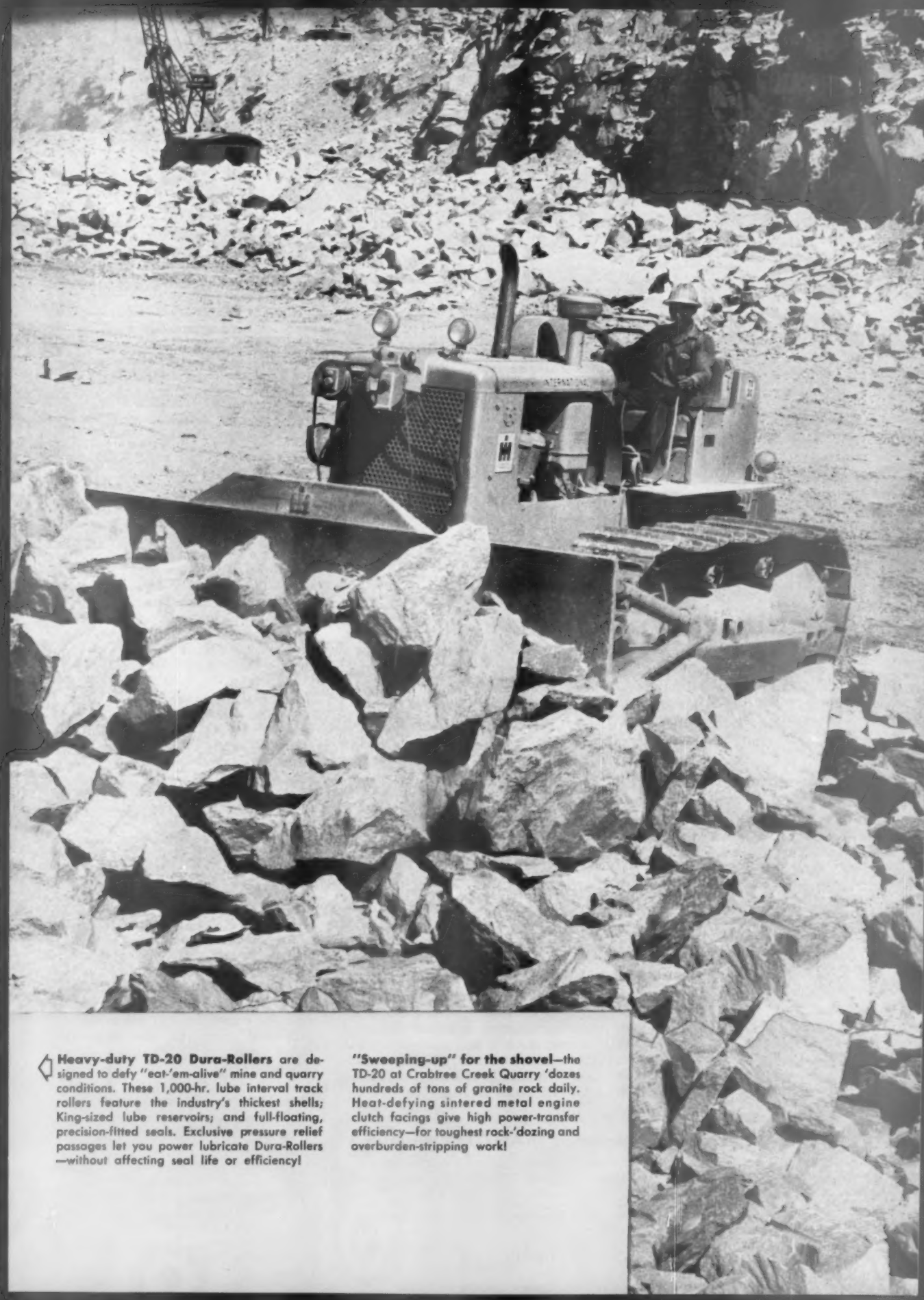
Exclusive International 3-point-mounting allows free track oscillation for rough mine and quarry duty—and maintains positive, life-prolonging alignment. TD-20 weight rides smoothly on thick-shelled Dura-Rollers—the dual-protected track rollers that make, 1,000-hr. lube intervals practical!

Compare TD-20 performance to anything else on tracks—for capacity, economy, and long life. Measure production-boosting features like "single-stick" shift, 6-speed full-reverse transmission; and cycle-speeding Shuttle-Bar control. See your International Construction Equipment Distributor for a demonstration.



International® *Construction Equipment*

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois
A COMPLETE POWER PACKAGE



Heavy-duty TD-20 Dura-Rollers are designed to defy "eat-'em-alive" mine and quarry conditions. These 1,000-hr. lube interval track rollers feature the industry's thickest shells; King-sized lube reservoirs; and full-floating, precision-fitted seals. Exclusive pressure relief passages let you power lubricate Dura-Rollers —without affecting seal life or efficiency!

"Sweeping-up" for the shovel—the TD-20 at Crabtree Creek Quarry 'dozes hundreds of tons of granite rock daily. Heat-defying sintered metal engine clutch facings give high power-transfer efficiency—for toughest rock-'dozing and overburden-stripping work!

(Continued from page 54)

Production of nonmetallics in eastern states surveyed

THE OUTPUT OF ROCK PRODUCTS in 14 eastern states during 1959 is covered in preliminary reports issuing from the Pittsburgh headquarters of Region V, Bureau of Mines. Generally higher production of construction materials was reported but there were some outstanding regional variations from the year 1958.

A whopping 41-percent increase in lime production was reported in Virginia. Last year's total of 667,000 short tons was valued at $7,830,000, compared to 1958's 471,313 short tons, worth $5,533,000. Virginia also produced more sand and gravel—24 percent—than it did the year previously. Figures for 1959 and 1958, respectively, are 8,825,000 short tons, valued at $12,619,000, and 7,158,000 short tons, worth $10,834,000.

Portland cement production in Ohio showed a notable gain—18 percent. The 17,700,000-bbl. total was valued at $59,500,000, compared to 14,960,-087 bbl., valued at $50,092,000 in 1958. Increased road building and construction activity in New Jersey accounted for a 19-percent increase in stone production in that state. For 1959 the tonnage was 9,828,000; for 1958, 8,228,860. Respective values were $22,259,000 and $19,193,000.

Biggest drops in sand and gravel production were reported by New Hampshire, off 29 percent, and Maine, off 24. New Hampshire produced 3,507,000 short tons in 1959 and Maine, 6,775,000.

Highway program: new bill is unlikely this session

LITTLE PROGRESS IS EXPECTED during the current Congressional session on any new highway revenue bill. Rep. Wilbur Mills, chairman of the House Ways and Means Committee, declared that the committee will not consider additional funds for the Highway Trust Fund. Noting that the recently instituted highway cost allocation study will be presented to Congress in 1961, Rep. Mills said, "Very frankly, I want to know more about the cost (of the program) before we go any further with it."

Highway costs were the target of criticism from Sen. Harry F. Byrd of the Senate Finance Committee. He

(Continued on page 60)

"We tried several big haulers... and the 65 Payhauler® tops 'em all!"

New Hope's "65's" speed full 19-ton loads of dolomite from quarry to 300-ton-per-hr. capacity crusher—with a maximum climb-out grade of 16% and an 800-ft. haul! The 250-hp "65" travels up to 36 mph.; the 375-hp "95" up to 38 mph.!

—New Hope Crushed Stone & Lime Co., New Hope, Pa.

"Before buying two International® 65 Payhauler trucks, we had demonstrations by several large haulers," reports Edgar N. Putnam, for New Hope Crushed Stone & Lime Co.

"The '65' topped them all for production, ease of operation, and all-around efficiency. Main '65' features are ample power, balance for full-load delivery, and genuine operating ease and safety."

Both the 19-ton 65, and 27-ton 95 Payhauler trucks have the strength-multiplying International corrugated body design—that sheds weight, increases capacity. The direct-start International "817" engine super-powers both "65" and "95"—to outspeed former models, up to 40%. And both "65" and "95" highball full loads safely with reserve-area braking and new course-holding power-steering!

Compare—prove on the job that Payhauler gives you top off-road capacity; top power-to-weight ratio; top profit-earning ability! Let your International Construction Equipment Distributor demonstrate!

Get 11-second Payhauler dumping with exclusive inverted hoist body-positioning. Positive up-and-down snubbing control prevents machine-mauling dumping impact!

International®
Construction Equipment

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois
A COMPLETE POWER PACKAGE

(Continued from page 58)

wrote Commerce Secretary Frederick H. Mueller, calling financing approved by the Highway Act of 1959 "special assessments to pay for the sins of profligacy which should come off fully and finally when they expire, if not before." Secretary Mueller replied that the government must "bend every effort to improve the direction of highway policy and to revamp the entire system of financial management."

Proponents of better highways are concerned by this growing critical atmosphere, comments American Road Builders Association. Much of the discussion at its January convention in Cincinnati centered on the subject.

Refusing to be pessimistic about the problem is Sen. Robert Kerr. A member of both the Senate Public Works and Finance Committees, Sen. Kerr told the Oklahoma Highway Users Conference that he would not "accept the premise that this nation cannot afford to build the roads that its expanding population and economy requires." Sen. Kerr favors a program of borrowing and credit for expansion and development. He firmly stated that the highway program must be kept on schedule.

Diversification promises to pay off for producer

MINERALS & CHEMICALS CORP. OF AMERICA expects gains in 1960, particularly from its diversification program and the accelerated flow of new products, according to Barron's "News and Views of Investments." Earnings more than doubled in the first nine months last year over 1958, from 37 to 80 cents per share. All segments of the business outpaced year-earlier levels. Attapulgite is its major product.

The corporation was formed in 1954 by the merger of companies engaged mainly in the mining and processing of kaolin, bauxite and fuller's earth and was broadened by the acquisition of limestone operations from Kelley Island Lime. Its mines, quarries and plants are located in Arkansas, Florida, Georgia, Ohio and Virginia.

The major research goal is to make the company's natural minerals competitive with and better than synthetic chemicals and to develop new and prime natural chemicals. Two of its new products are: Attacote, a spacing agent developed for the nitrate, mixed

(Continued on page 62)

After 20,000 hours of trouble-free power "Old Faithful" retired by new UDT-817!

An International UD-24 engine—called "Old Faithful" by her owners—has racked up 20,000 hours of continuous trouble-free performance on a rock crushing job in Kansas. That's an average of nine hours per day for six years! At 13,000 hours a gasket had to be replaced, but there have been no major repairs. The operation, owned by Roy Baker of Valley Falls, produces 900 cu. yds. of crushed rock daily with a 32 x 40 Universal crusher.

Partners in the company, Mike and Bert Baker, say, "We decided to retire our old faithful UD-24 after it had piled up nearly 20,000 trouble-free, hard-working crushing hours. The new UDT-817 was chosen because of its greater power, direct starting and easy installation. Fuel consumption on the 817 is low, considering the power we get. And with all that power we can eliminate secondary crushing by just reducing the jaw opening."

Roy Baker says, "Of course I bought another International!" And that about sums up the attitude of contractors all over the country—they know from experience that Internationals stand up under heaviest work, are immune to dust and grit—and will pay back the investment faster than any other.

Check with your International Engine Distributor or Dealer soon, and find out how little it costs to power —or repower—your equipment with International engines. See the full line of engines and power units—16.8 to 385 max. hp.

INTERNATIONAL® ENGINES

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois
A COMPLETE POWER PACKAGE

(Continued from page 60)

fertilizer and similar industries, and Kaospheres, a pelleted catalyst in spherical form.

Late last year a new company was formed jointly by Minerals & Chemicals Corp. and Neville Lime Co. of Ohio. Called Cuyahoga Lime Co., it will construct a plant at Cleveland to supply metallurgical lime to the steel industry.

Fire destroys building at Eau Claire Sand & Gravel

A MACHINE SHOP-STORAGE SHED was destroyed when fire broke out January 7 at the Eau Claire (Wis.) Sand and Gravel Co. plant. Loss of the building and contents was placed at $50,000 to $60,000. Some equipment —a truck, tractor and generator— were removed from the blazing building, but other equipment and contents could not be saved. Whipped by the wind, flames endangered a crane that had been brought alongside the building for repairs, as well as a conveyor leading to the processing plant. However, firemen were able to confine damage to the one structure.

Penn State, industries join in trainee program

COMPANIES IN THE MINING INDUSTRIES will benefit from a student-trainee program at Pennsylvania State University. It is designed to provide a steady supply of technical personnel for the participating industries. One of the first nine companies to take part in the program is General Crushed Stone Co., Easton, Pa.

This student training program was explained by Howard L. Hartman, head of the Department of Mining. He said that students enrolling will attend school six months and work in industry six months alternately over a four-year period. In the fifth year, they will remain in school continuously. The curriculum will be identical to the regular four-year course in mining engineering, but will be rearranged to permit the student to obtain his B.S. in five years.

Companies who sponsor students will provide them with employment. To maintain job continuity, most companies will sponsor pairs of students

(Continued on page 64)

Raise the clam and you have a full-size, full-capacity dozer for stripping overburden or pushing gravel down the bank, tons at a time. 'Dozer rides on exclusive "skid shoes," to keep cut accurate, and prevent uneven blading.

Doubles for DOZER, SHOVEL, SCRAPER, CLAMSHELL... *even dynamite!*

Clam-action 4-in-1 offers you money-making possibilities, unlimited

Open the clam of an International Drott 4-in-1 and a whole new range of equipment versatility opens for you. Each big-capacity 4-in-1 action "doubles" for one or more specialized earthmovers!

Skid-Shovel action takes over for the power shovel—and with tremendous triple-power, pry-over-shoe break-out action often doubles for dynamite in grubbing stubborn stumps, buried boulders, or hard clay, gumbo, and rock. *"Carry-type scraper"* action works like a scraper or dragline on jobs like stripping overburden...also gives you grader-like precision on haul road maintenance. *Clamshell action* lets you "back-drag"; grab and load solid objects like stumps; "surround" loose materials without chasing them! *Bulldozer action* gives you versatile blading, depth-regulated by radius control!

You adjust and control each 4-in-1 action, seconds-fast, hydraulically from the tractor seat. Each action gives you a wide range of job-handling working positions. And only the 4-in-1 has the positive performance protection of shock-swallowing Hydro-Spring!

Just move the machine selector lever to put a whole spread of equipment actions at your fingertips!

Prove first hand that a versatile 4-in-1 can give you money-making ability, unlimited! Let your International Drott distributor demonstrate!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT®

Instead of burrowing into the bank and risking slide dangers, use clam to back-drag loose material within safe reach. Then load either with clamshell or regular 4-in-1 bucket action.

Get higher reach than roll-forward type buckets by bottom-dumping! Opening the clam pulls sticky material from bucket surfaces—gravity pull does the rest!

(Continued from page 62)

so that one is working while the other is studying. Interested candidates should apply to Penn State immediately, as the plan goes into effect in July.

This program, said Mr. Hartman, results from concern about the shortage of engineers entering the mining industry in contrast with the demand and opportunities for young men in this field. "A sharp decline in mining engineering enrollment at most universities during the past two years indicates the situation is growing steadily worse," he added.

Rock companies expand through mergers, purchases

THERE ARE SEVERAL EXPANSIONS in rock industry news. These have been accomplished through mergers or acquisitions. A large transaction, reported at more than $1 million, was one in which Trinity Sand and Gravel Co., subsidiary of Wesco Materials Corp., Dallas, Texas, gained control of several building materials firms. These are the firms involved: Carl Wall Building Material Co., with plants in Beaumont and Port Neches; Beaumont Building Material Co.; and Sabine Equipment Co., Ready Mix Concrete Co. and Sabine Builders Co., Port Arthur.

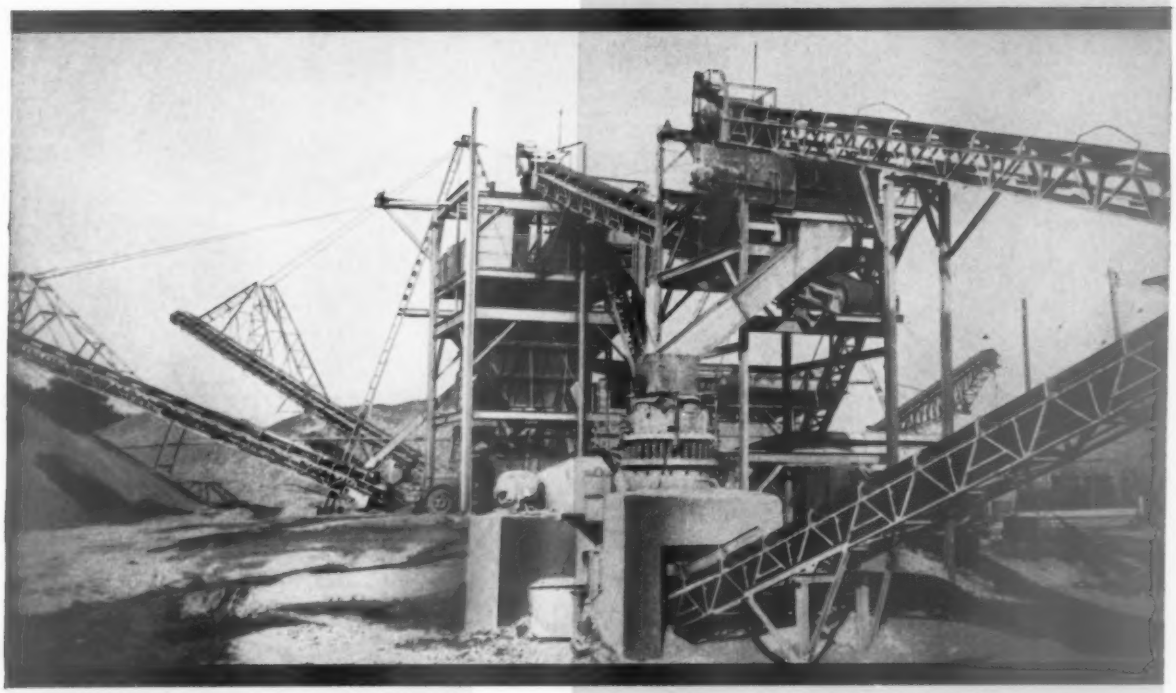
Four San Diego, Calif., area firms have formed a new corporation, principally for advertising and promotion purposes. Known as San Diego Rock Products, the corporation will comprise these affiliates: Caudell and Johnson, sand and gravel producer; San Diego Cement Co., a hauling concern; San Diego Transit-Mixed Concrete, and San Diego Prestressed Concrete Company.

Boise Cascade Corp., Boise, Idaho, has purchased two sand and gravel and ready-mixed concrete companies. One is Klinker Sand & Gravel Co., Seattle, Wash., which it will operate as a division. Charles R. Hartman will continue as general manager of Klinker Sand & Gravel, one of the oldest producers of sand, gravel and ready-mixed concrete in the Puget Sound area. The other acquisition is Chaussee-Swan Gravel Co. of Boise. A major supplier of sand, gravel and ready-mixed concrete in the Boise Valley, the company was founded in 1945 by A. J. Chaussee.

Another merger in the news is the one previously announced in which

(Continued on page 67)

HOLLY MANUFACTURING AND MINING COMPANY processes 300-400 tons of gravel per hour with 5 SIMPLICITY screens!



Write for information on Simplicity equipment today.

At the Holly Manufacturing and Mining Company, Holly, Michigan, pit run gravel is brought from the pit to a surge pile on belt conveyors. From the surge pile, a belt conveyor takes the gravel to a Simplicity 5' x 14' Model "D" 2-deck screen. At this point, all oversize material, including rocks up to 8 inches in diameter, is run through a cone crusher and then re-circulated to the screen. A belt then takes all through material to two Simplicity M-11 4' x 12' 3-deck screens where the gravel is washed, sized, then stockpiled to be used as needed. The other 2 Simplicity screens are used for processing special products.

All 5 Simplicity screens have been in operation for over two years, part of the time on a two-shift schedule, with a minimum of down time.

Gravel plant operators are getting quick, economical and dependable processing of their material with Simplicity Screens, Feeders and Conveyors.

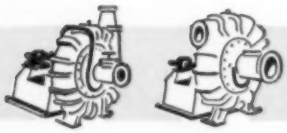
Simplicity
TRADE MARK REGISTERED

ENGINEERING COMPANY • DURAND 13, MICHIGAN

220

SALES REPRESENTATIVES IN ALL PARTS OF THE U.S.A.
FOR CANADA: Simplicity Materials Handling Limited, Guelph, Ontario.
FOR EXPORT: Brown & Sites, 50 Church Street, New York 7, N. Y.

Enter 1239 on Reader Card



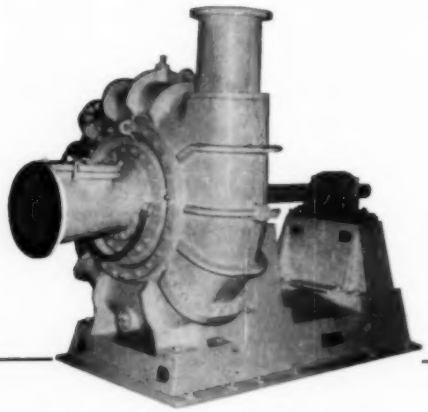
WAS HE SURPRISED!!

THOMAS

DURABLE DREDGE PUMP

NEEDED NO REPAIRS

Suction dredge of W. D. Jeffrey-Sand Department in use on Arkansas River at North Little Rock.



W. D. JEFFREY—SAND DEPARTMENT
P. O. BOX 165
PHONE FRANKLIN 8-7517
NORTH LITTLE ROCK, ARKANSAS

November 27, 1959

Thomas Foundries, Inc.
P. O. Box 1111
Birmingham 1, Alabama

Gentlemen:

Thank you for inspecting our pump on November 19 as per our request.

Our Series JL Thomas (10") Pump has been in constant use for 18 months and we expected wearing parts would be needed by this time. It was gratifying to find we have at least several more months life in the impeller and liners.

This is a very busy season with us and any down time would be very inconvenient as well as costly. We are glad we have a Thomas Pump.

Yours sincerely,

W. D. Jeffrey

This sand and gravel operator naturally expected extra long service life from the Thomas pump he bought for his new dredge because he knew THOMAS pumps had wide reputation for durability. But after 1½ years of service, he assumed the pump needed repairs. November 4 he wrote to ask us to send him one of our service men and necessary pump repair parts.

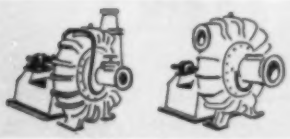
The Thomas engineer duly arrived, took down the pump, and to Mr. Jeffrey's surprise and gratification it was found that the impeller and liners were good for several more months of service!

Do you wonder that Mr. Jeffrey closes his letter of Nov. 27, 1959 above by writing: "We are glad we have a THOMAS pump"?

Sand and gravel operators throughout the U.S. enthusiastically agree with Mr. Jeffrey. They all know from experience that THOMAS pumps give longer life and higher sand and gravel production. The reason is special pump design permitting use of genuine Thomas Ni-Hard alloy iron in all wearing parts.

"You cannot buy at any price a more DURABLE PUMP FOR SAND AND GRAVEL—YOU CANNOT BUY ANOTHER PUMP THAT WILL MAKE YOU AS MUCH MONEY."

(Available in sizes from 6" to 16" discharge)



THOMAS FOUNDRIES Inc.

P. O. BOX 1111, BIRMINGHAM, ALABAMA

Enter 1294 on Reader Card

(Continued from page 64)

Material Service Corp. became a division of General Dynamics. This became effective at the close of business December 31, 1959, subsequent to approval of stockholders in separate meetings December 29.

Basically, the merger agreement called for Dynamics to exchange 2,064,516 shares of a new issue of convertible preference stock, without par value, for 57,532 shares of MSC common stock. Dividends will begin in 1964. Each of the new shares is convertible into 1.056818 shares of General Dynamics common stock, based on a conversion price of $55 a share of Dynamics common stock and a conversion value of $58.125 a share of preference stock. The conversion may be made in certain allowable percentages from 1961 to 1966. The privilege will end in 1974.

Maine clay recommended for lightweight aggregate source

ONE HUNDRED CLAY SAMPLES from the Sandy River area in west central Maine and from localities in southwestern Maine were studied for suitability as lightweight aggregate materials. Results are reported in "Glacial Lake and Glacial Marine Clays of the Farmington Area, Maine, Origin and Possible Use as Lightweight Aggregate," by D. W. Caldwell.

Mr. Caldwell says the expanded clays compared favorably with gravel and a commercial lightweight aggregate. Physical, chemical and thermal properties indicate that the clays have the requisites of a lightweight aggregate of commercial value, he adds. An estimated reserve tonnage of 150 million tons of Maine marine and fresh water clays is available.

Graham Bros. Inc. gets big aggregates contract

GRAHAM BROS. INC., El Monte, Calif., is filling a contract calling for 1.25 million tons of rock that will serve as a foundation for two new piers in Long Beach Harbor. Barges have traveled between the company's quarry on Catalina Island and the harbor construction site where they dump the rock. Value of the contract is $2,542,500.

(Continued on page 68)

(Continued from page 67)

Precipitators will collect cement dust at Dundee

DUNDEE (MICH.) CEMENT CO.'S new two-kiln plant has been producing test clinker in preparation for start of full production. At the $25-million plant, $10 million was spent for machinery. Of that amount, $1 million went toward the purchase of electrostatic precipitators that remove 99 percent of impurities collected at 27 points.

Dust salvaged will be returned to the production process. The two 16½ x 460-ft. kilns will have an annual capacity of 5 million bbl. Formal opening of the plant will be held this spring.

Phosphate fertilizer firms plan ambitious expansions

IN A ROUNDUP of phosphate fertilizer producers, Chemical Engineering magazine uncovered a long list of firms with expansion plans. Additions to facilities will be made by General Chemical somewhere in the Midwest; American Cyanamid, Brewster, Fla.; Smith-Douglass, Streator, Ill., and Texas City, Texas; International Minerals & Chemical, site not chosen; Davison Chemical, Joplin, Mo., and Bartow, Fla.; Virginia-Carolina, Nichols, Fla.; Monsanto, Columbia, Tenn., and Soda Springs, Idaho; Bunker Hill, Kellogg, Idaho; and Swift, Farmers Fertilizer and U. S. Phosphoric at undisclosed locations.

The spur behind the boom is the government's reduction of acreage allotments under its farm program. Farmers are seeking to get the most crop production per farmable acre, so there will be a mounting demand for high-analysis, phosphate-type fertilizers. More than one phosphate producer, said the magazine, has sold out its entire expected 1960 production.

Construction contracts set an all-time record in '59

CONSTRUCTION CONTRACTS in the United States (excluding Alaska and Hawaii) hit a record $36.3 billion in 1959, reports F. W. Dodge Corp., construction news and marketing specialists. The yearly total was 3 percent ahead of 1958.

December figures showed strength, despite the fact that they were 3 percent below December 1958. "The December decline was the smallest in any of the last five months," said Dodge chief economist, Dr. George Cline Smith.

"Housing was particularly encouraging . . . dollar volume of contracts for residential building was 1-percent ahead of December 1958. But the real strength came in the nonresidential building categories. These totaled $790,238,000, 6 percent above December of the year before."

For 1959 as a whole, contracts and percentage changes from 1958 were: residential, $17.15 billion, up 17 percent; nonresidential, $11.4 billion, up 4 percent, and heavy engineering, $7.7 billion, down 18 percent.

Canadian suppliers look for wider U. S. gypsum markets

EXPANSION OF GYPSUM PLANTS in the southern United States has given Canadian suppliers of crude gypsum hope for a wider market, writes T. F. Harris, Consul and Trade Commissioner at New Orleans, in Foreign Trade. The Ottawa publication carried his remarks that Canadians will have competition in this expanding market from domestic producers, and from others in Mexico and Jamaica. The latter countries have greatly increased exports of crude gypsum to the U. S. since 1955.

National Gypsum Co. increased its plant capacity at Savannah, Ga., 25 percent, making it the largest gypsum plant in the world. Bestwall Gypsum Co. is following up construction of its $8.5-million gypsum plant in Brunswick, Ga., with another, for $5.5 million, at New Orleans. The second will be completed by June. These three plants are the reasons that Canadians hope for a wider market. In 1957, the U. S. imported 4,334,467 short tons of gypsum, of which Canada supplied 3,686,237 short tons.

Intermountain phosphate production boost seen

WESTERN PHOSPHATE ROCK PRODUCERS in the Intermountain area may boost production about 20 percent this year, according to a report from Salt Lake City. This would boost production to 3 million long tons from 1959's 2½ million. Of the latter figure, 1½ million tons went into furnaces for production of elemental phosporus, the remaining million went into production of phosphatic fertilizers.

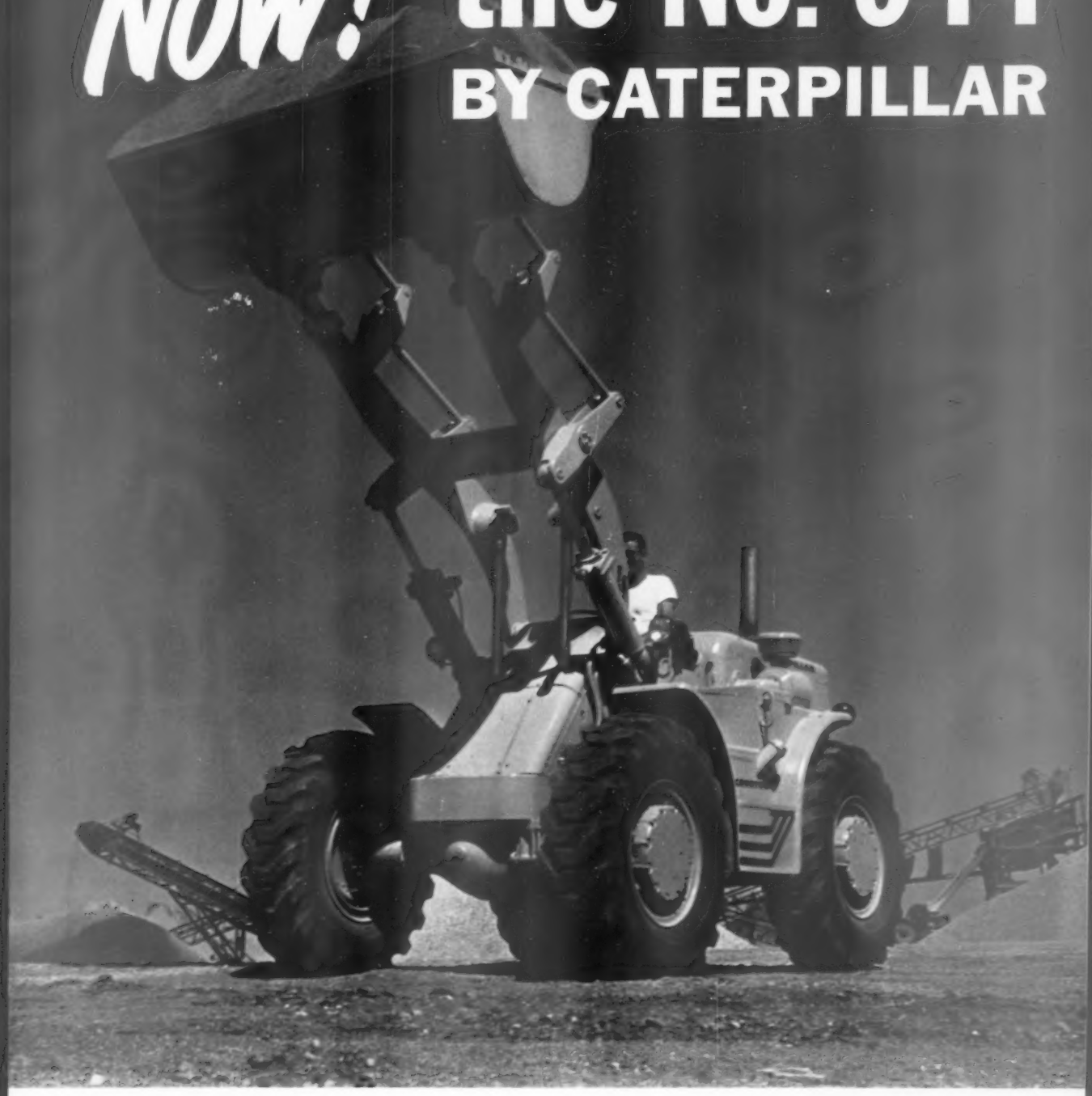
A new plant to produce an estimated 200,000 tpy. of raw phosphate that will be upgraded to elemental furnace charge may be started this spring near Vernal, Utah. San Francisco Chemical Co. is reported to be studying the project. Mining would be by the open pit method.

Trap rock producer has motto that will endure

NEW YORK TRAP ROCK CORP. has a motto that will last—it has been struck on a bronze plaque for display in the lobby of the company's headquarters on Old Mill Road, West Nyack, N.Y. Just as lasting are the principles it embodies for successful business management. "The Trap Rock Way" was written several years ago by Wilson P. Foss, president, who also invited other officers to contribute to the statement of the company's aims, objectives and policies. It is the preface to their organization manual.

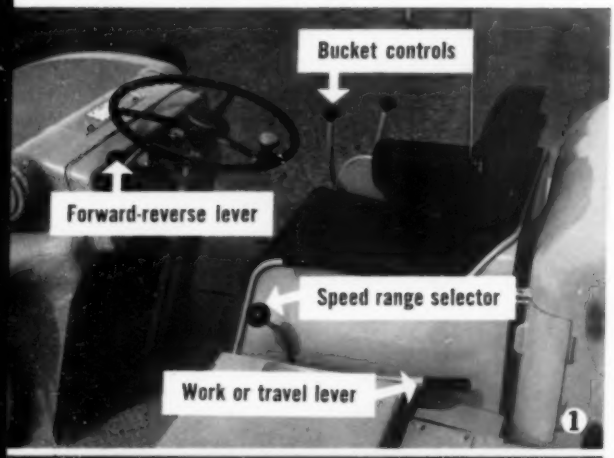
(Continued on page 73)

NOW! the No. 944
BY CATERPILLAR



THE *FIRST*
OF A NEW WHEEL LOADER LINE

the No. 944 ...designed for action,



IT'S HERE . . . the Cat No. 944 . . . rated at 2 cu. yd. capacity . . . the first of a completely new line of equipment that will soon include the No. 922 (1¼ cu. yd. bucket) and the No. 966 (2½ cu. yd. bucket).

Watch for these new machines with the bold new design . . . they're ready to bring new standards to wheel loader operation.

Take a look at the No. 944's big, new features . . . features that give it lively response and make it the easiest and safest wheel loader to operate. See it in action at your Caterpillar Dealer. Ask him for a demonstration. See for yourself how the *new design* pays off on your loader jobs.

DESIGNED FOR ACTION . . . with plenty of power for both machine drive *and* bucket hydraulics. Choose from two great, new engines . . . the compact 4-cylinder diesel, turbocharged for maximum efficiency . . . or the 6-cylinder gasoline engine. Both are 105 HP units, fully equipped. Both are made to the same rigid standards. Whatever the requirements of your operation, there's a No. 944 powered to meet your needs.

Tailored to this power is the torque converter and power shift transmission, providing smooth, instant, finger-tip shifting. A full range of work and travel speeds is available on the No. 944. And reverse speeds are 25% faster than forward speeds . . . important in reducing cycle times. Travel Range gives 2-wheel drive for roading . . . Work Range automatically puts power to all 4 wheels.

Machine and bucket controls are located for easy handling(**1**) —the forward-reverse lever is mounted on the steering column.

Both bucket control levers have kick-out devices. The lift control releases at dumping height—the tilt control positions the bucket for digging. And for full bucket loads every pass the 2 cu. yd. bucket tilts back 41° at ground level. The high lift and *extra-long reach* make truck loading faster, easier.

There's plenty of action designed into the No. 944, ready to speed up your loader jobs.

DESIGNED FOR SAFETY . . . in the bold new lines(**2**). Bucket lift arms and pivot points are completely in front of the operator's area. This gives the operator new freedom of movement . . . greater all-around visibility.

Wide steps(**3**) make it safe and easy to get on or off . . . from either side. No need to climb over tires. Fenders provide a handy platform for checking the engine and they protect the operator from rocks and mud(**4**).

The No. 944 brake system gives safer, more precise control(**5**). The *left* brake neutralizes the transmission *as* it stops the machine. This gives superior loading action in extra-tough material.

Traxcavator safety, economy

The *right* brake leaves the transmission engaged . . . for full control when creeping, working on steep slopes or roading downhill.

These and other safety-bonus features give the No. 944 operator greater confidence, greater efficiency.

DESIGNED FOR ECONOMY . . . in the Caterpillar tradition. Sound engineering, modern design, service accessibility, quality construction, responsible parts and service coverage all add up to a new kind of stability—mechanical stability—in the No. 944. The many cost-saving features of this NEW wheel loader will pay off big in your operation!

Offered in a full line of versatile attachments and accessories are forks, cab(**6**) and special buckets, including the *exclusive side dump* that gives the No. 944 added efficiency.

BRIEF SPECIFICATIONS

Horsepower (Net)	105*
Bucket capacity	2 cu. yd.
Bucket reach (@ 7 ft. dump height)	50¾ in.
Over-all width (bucket)	93½ in.
Wheel base	88 in.
Speeds, forward (4)	0-24 MPH
reverse (4)	0-30 MPH
Weight, shipping (with diesel engine)	20,780 lb.
(with gasoline engine)	20,440 lb.

* For comparative purposes, the maximum rating of the D330 Engine used in the No. 944 is 135 horsepower.

THE No. 944 TRAXCAVATOR...

NEW IN DESIGN AND LOADED WITH PERFORMANCE

Learn more about it. Visit your Caterpillar Dealer the week of March 14

There's a wealth of LOADER KNOW-HOW behind the No. 944. It comes from the builders of the best accepted track-type tractor-shovels in the field.

Every feature is designed for *efficient work*. Plenty of horsepower . . . finger-tip shifting . . . smooth, fast bucket action . . . outstanding operator comfort and safety. The result is the bold, new No. 944 . . . the *outstanding* performer in its class!

For complete facts, see your Caterpillar Dealer now.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

DIESEL ENGINES · TRACTORS · MOTOR GRADERS
EARTHMOVING EQUIPMENT

A GREAT NEW PRODUCT IN THE CATERPILLAR TRADITION

(Continued from page 68)

Pressurized tank trucks used for cement delivery

BULK CEMENT DELIVERIES from the West Winfield, Pa., plant of Penn-Dixie Cement Corp. are now being handled by four pneumatic tank trucks. Unlike other weatherproof tank trucks that use augers for unloading the cement cargo, these are "bug-bomb" type containers mounted on trailer trucks. Each carries a cargo of 18¾ tons.

After loading, air is pumped in, causing a 12 to 15-lb. pressure. Then, reaching the destination, the load is pneumatically forced out through a 4-in. hose at a rate of 200 bbl. per hour.

Texas Portland Cement Co. trustees report on progress

REORGANIZATION PROCEEDINGS of Texas Portland Cement Co., Beaumont, Texas, are reported periodically to stockholders and creditors by the trustees, Chilton O'Brien and Martin Davis. In a recent newsletter, completion of plant improvements previously scheduled and attainment of full production schedule were reported. Efforts are being made to increase production capacity of equipment.

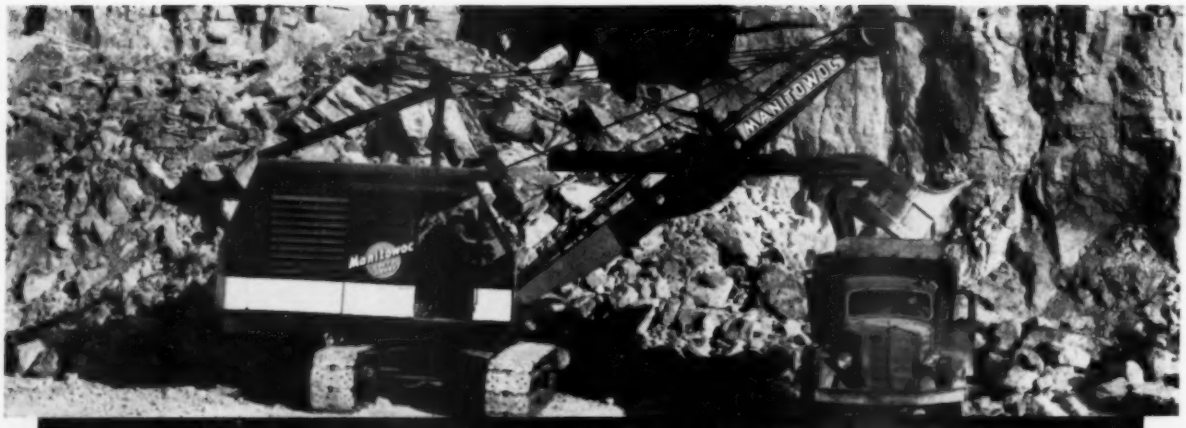
The supply building, the clinker storage building and conveyor extension were completed or about to be completed, and plans were made for additional cement storage silos, to include loading facilities.

In the fifteen months from July 7, 1958, through September 30, 1959, the company had a net operating profit of $418,913.63 from sales of $2,174,-667.91. When trustees' expenses were deducted, the operating profit became $338,116.47.

Nigerian cement plant to use modern techniques

A NEW CEMENT PLANT under construction in Ewekoro, Nigeria, described as "the largest industrial manufacturing project so far undertaken," is expected to be in full production before the end of this year. The cost is estimated at $11.2 million (U.S.). Funds are being provided by three partners: Associated Portland Cement

(Continued on page 75)



What makes MANITOWOC

a great quarry shovel?

Here's the straight story

More pit operators turn to Manitowoc every year for big, steady output with the lowest maintenance cost. They've found that these husky shovels stand up to the grinding punishment of quarry work without sacrificing power, speed or operating ease. Following are just a few of the basic reasons why you should see your Manitowoc distributor right now for the full, profitable story.

A SOLID, WIDE-SPREAD BASE with a one-piece carbody mounted right on the crawler frames. No amount of hard rock digging can affect the rugged crawler base.

COMPACT, POWERFUL MAIN MACHINERY makes full use of every unit of horsepower. Line pulls exceed normal requirements to give you reserve capacity.

A FAST CYCLE WITH DIRECT POWER-FLO drive provided by the unique Manitowoc slide pinion arrangement. Only working gears turn — all others are disconnected until their function is needed.

UNDER-DRIVE, TWIN DIPPER STICKS take the shock of rock in stride . . . deliver a more powerful crowding action at the dipper.

STURDY, ALLOY STEEL BOOM welded in elongated tubular form easily meets the extraordinary bending and twisting stresses of quarry work.

MANITOWOC ENGINEERING CORP.
(A subsidiary of The Manitowoc Company, Inc.)
MANITOWOC, WISCONSIN

SHOVELS
1¼ to 6 YDS.

Manitowoc

CRANES
25 to 125 TONS

Enter 1238 on Reader Card

CALENDAR

OF COMING EVENTS

March 31-April 1, 1960
National Slag Association, Plant Operators Committee Meeting, Jack Tar Hotel, Galveston, Texas

April 28-30, 1960
Texas Aggregates Association, sixth Annual Convention, Hilton Hotel, El Paso, Texas

April 28-30, 1960
The American Institute of Mining, Metallurgical and Petroleum Engineers, Pacific Northwest Metals and Minerals Conference, Sheraton Hotel, Portland, Ore.

May 17-19, 1960
Cement Industry Subcommittee, American Institute of Electrical Engineers, Technical Conference, Pfister Hotel, Milwaukee, Wis.

May 23-25, 1960
National Lime Association, 58th Annual Convention, The Cloisters, Sea Island, Georgia

June 13-14, 1960
National Limestone Institute Inc., Board of Directors' Mid-Year Meeting, Edgewater Beach Hotel, Chicago

June 26—July 1, 1960
ASTM annual meeting and apparatus exhibit, Chalfonte-Haddon Hall, Atlantic City, New Jersey

October 10-13, 1960
American Mining Congress, 1960 Metal Mining and Industrial Minerals Convention and Exposition, Las Vegas, Nev.

October 17-21, 1960
National Safety Council, 48th Annual National Safety Congress, Chicago, Ill.

INDUSTRY NEWS

(Continued from page 73)

Manufacturers, Ltd. (51 percent), the Western Nigeria Development Corp. (39 percent) and the United Africa Co., Ltd. (10 percent).

Its capacity of 200,000 tpy. is likely to be sufficient to supply the requirements of the western region of Nigeria, but provision has been made for future expansion to meet anticipated growth in demand. Modern techniques of cement manufacture will be used at the plant which will employ 24 Europeans and 280 Nigerians.

The cement industry in Africa also may be supplemented by a $12.6-million (U. S.) plant considered for Bonyeri, Ghana. The chairman of the Industrial and Agricultural Development Corp., E. Ayeh Kumi, said that a team of cement specialists from the United States would inspect the Bonyeri site.

Pavement yardage

AWARDS OF CONCRETE PAVEMENT for the month of December and for the 12 months of 1959 have been classified by Portland Cement Association as follows:

	Sq. yd. awarded during: December	1st 12 mos.
Roads	2,559,617	49,336,777
Streets and alleys	3,757,489	34,954,368
Airports	372,132	9,070,290
Totals	6,689,238	93,361,435

END

HINTS & HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Screen changing simplified

CHANGING SCREEN SURFACES is a bother, and hard work because the sections are heavy and bulky. At this Midwestern stone plant, to complicate matters, the final sizing screens are mounted very high above the ground as well.

Showing foresight, the plant designers included a simple overhead crane, installing it at the most convenient time—when the plant was built. Changing screen cloth is now both quick and easy.

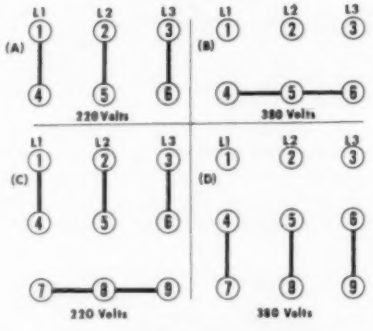
Screen cloth use

NOT A THING GOES TO WASTE around most rock products producers' operations—even old screen cloth. We've seen an unusual number of plants recently where these scraps of woven wire have become a standby for improving the safety of the plant. A Chicago sand and gravel producer has enclosed the tail end of every conveyor with a simple enclosure of old screen cloth. Every takeup and every conveyor drive is similarly protected. This system is not only safer for the workmen, but tends to prevent tampering by anyone but the regular maintenance man.

A southern producer has gone one step further, by building enclosures with screen cloth mounted on light structural frames. Not heavy enough, really, to stop an aggressive vandal or thief, the enclosures keep casual traffic away from valves, switches, transformers, piles of construction material, storage areas and other restricted areas.

Screen cloth is extremely useful for these purposes, for the size of the opening can be matched to the application. Very fine meshes can be used to keep hands and fingers at a distance; heavy meshes will resist the inroads of men, animals or even trucks. Most screen cloths are high-carbon steel, but can be cut and welded by anyone familiar with this material.

Reconnecting 3-phase motors



THE PLANT MAINTENANCE MAN in a rock products plant is a versatile individual who usually handles his problems with the aid of native ingenuity, and a text book or two. But here is a bit of first-hand information on how to reconnect 3-phase dual-voltage motors which is not ordinarily available in text books.

A 220-v., 3-phase delta-connected motor is not properly connected for its most efficient operation on a star connection, either with its three leads, as indicated in Fig. (A), or with six leads as indicated at (D), when powered by 440 v.

A bit of applied mathematics will show why this is true. Compare the coil potentials and currents on a star connected motor when energized by 440 v. by considering the following: Star voltage equals delta voltage x 3, or 220 v. x 1.73 = 380 v. This is 60 volts short of the 440 volts actually required; inadequate for any plant. This amount of inaccuracy may suffice for the casually-used motor under light loading, but not for the modern crushing or screening plant operating at top capacity.

If a group of motors is to be reconnected for the higher voltage, they should be powered by step-down transformers of the dry type. Only in this way can maximum use of the delta winding be obtained without the risk of burned-out motors.

The series star is suggested for 2:1 voltage connections, but it is desirable to bring out all nine leads instead of only three. This eliminates the job of removing end bells and simplifies the changes from high potential to low, or vice versa.

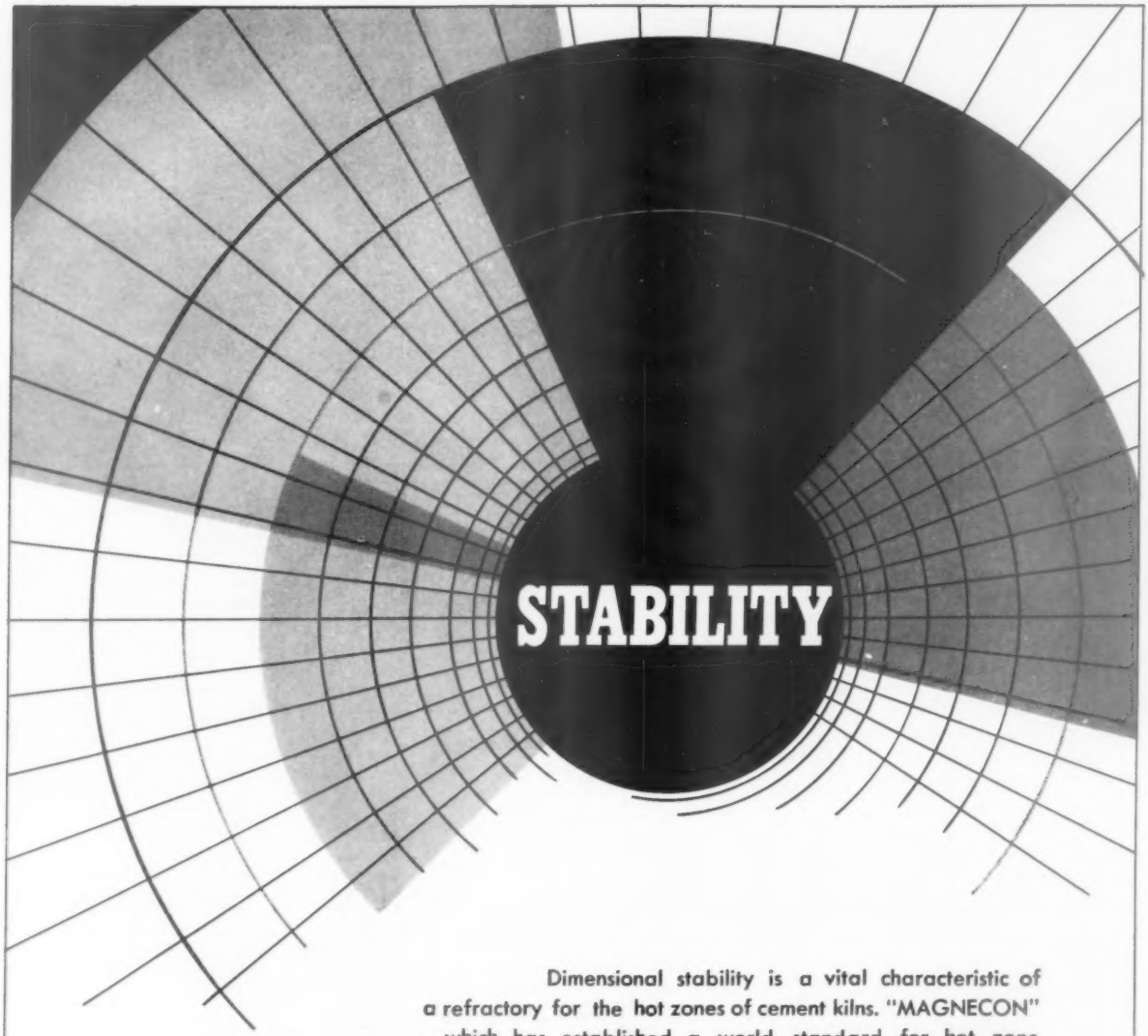
Paul C. Ziemke, Clinton, Tenn.

Weighing feeder

A SOUTHERN GRANITE PRODUCER has eliminated the problem of short-weight rail cars as well as over-weight cars. This was accomplished simply by using a weighing belt feeder under his rail loading bin. The feeder is hooked up to a control which stops the feeder motor when the predetermined weight has been reached, substituting an instrument for an operator's judgement.

The extra cost of the feeder and control has been recovered several times over in reduced manpower. Overloaded cars have been trimmed by hand, and the excess aggregates wasted.

(Continued on page 78)



Dimensional stability is a vital characteristic of a refractory for the hot zones of cement kilns. "MAGNECON" —which has established a world standard for hot zone liners—has very high dimensional stability. "MAGNECON" was the refractory selected for seven of the largest cement kilns in the world, all newly completed or still a-building:

Miron Freres, Montreal, Que.
Kiln 550′ x 15′ diameter

Ciments d'Obourg, Obourg, Belgium
Kiln 525′ x 15′ 7″ diameter
Kiln 525′ x 14′ 7″ diameter

Dundee Cement Co., Dundee, Michigan
2 kilns 460′ x 16′ 6″—15′
—16′ 6″ diameter

Ciments Liegeois, Harcourt, Belgium
Kiln 475′ x 13′ diameter
Kiln 510′ x 14′ 5″ diameter

CANADIAN REFRACTORIES LIMITED
CANADA CEMENT BUILDING, MONTREAL, CANADA

1908

Enter 1240 on Reader Card

(Continued from page 76)

Backhoes are useful

WE HAVEN'T SEEN MANY backhoe attachments in rock products plants. But the few we have seen or heard about have been ingeniously applied to do special jobs at which they are particularly adept.

An eastern crushed stone operator has an outcropping of a vertical formation of high-calcium limestone. A heavy clay is deeply imbedded in the seams, fissures and potholes—almost impossible to strip by conventional means. However, a backhoe is able to reach into the spaces between the outcropping ledges and to gather the overburden. This machine was the only economic alternative the quarry operator could devise short of hand digging.

A southern operator had another problem of stripping overburden. Once the ground was opened, there was an immediate accumulation of water. The mud turned to muck, and truck haulage was difficult. A backhoe was put to work along the top of the overburden, and now the trucks are loaded while they sit on firm ground.

Safety lights

WHEN THE LIGHTING CIRCUIT goes dead, the battery-powered lights go on; it's as simple as that. So simple, in fact, that this gypsum board maker installed several dozen of these miniature power packages all over his new plant. Every control center and every major drive on conveyor or machinery has at least one unit to light the area in event of power outage. Every stairway, walkway and hazardous location has these lights to assure worker safety when the regular lights are out. And, of course, the maintenance shops have plenty of auxiliary lighting so that they can operate during a power failure.

When the light circuits are restored to operation, the safety lights go off automatically. At the same time, they are recharged automatically to get them ready for the next emergency.

Portable conveyors still useful

PORTABLE CONVEYORS aren't as prevalent in the rock products industry these days as they were years ago. We don't know why this is so—maybe the tractor shovel and the field hopper have displaced the portable conveyor and the portable loader.

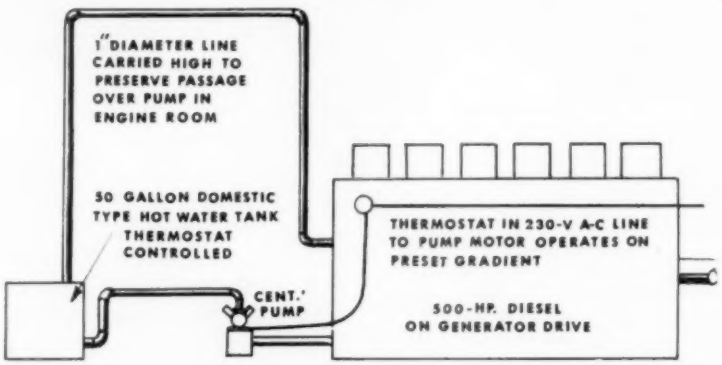
But these units are very valuable for quite a few producers who have been able to match them to a particular job which a portable conveyor can do well. A Chicagoland aggregates producer has a portable belt conveyor perched on top of a heavy gravel storage pile, just under the head end of a radial stacking belt. The portable unit vastly increases the capacity of the storage pile, acting somewhat like a sand slinger for the gravel. Since the big stacker moves radially, it can put other sizes of gravel into storage without changing the location of the portable. It is a job to move the unit, but a crane with a long reach is usually available for the infrequent changes.

A midwestern cement plant uses a portable belt conveyor with a portable car unloader. These machines started out as "temporary" units, but they have since been mounted on more permanent concrete foundations. They have proven to be exceedingly economical units for intermittent operation to unload sand, coal and gypsum. By the time a permanent car unloading system is designed and built, the units will undoubtedly be nearly written off the books—but ready for the next temporary job.

Portable manhole

A COST-CONSCIOUS quarry operator put in new machinery and changed the grade in the truck loading area, but the wiring and piping had to be put in first deep below the new grade. Instead of building forms to pour a conventional manhole for access to these utilities, it was considerably less costly to build the manhole with concrete pipe. Eventually the top pipe will be collared with a concrete curb and a steel ladder installed. The bell end of the pipe will be ideal to support a concrete cover.

Cold weather start for diesel generators



THE EXTREME WINTER temperatures in the Fairbanks, Alaska, area presented some troublesome starts on our large diesel engine, especially after a weekend shut-down. Heating the engine room would have proven too expensive; so with antifreeze circulation in the block, we thought little about spending extra time for Monday-morning start-ups.

A gasoline engine generator supplied the plant with standby light power and illumination service. This provided the juice for a 50-gal. domestic type water heater controlled by thermostat. When this hot water supply was forced through the diesel's line circuit by a centrifugal pump controlled by thermostat on the jacket, it practically eliminated sluggishness even in midwinter.

The sequence of operations was as follows: As the temperature of the coolant dropped to a predetermined value, the thermostat in the motor's line started the pump which ran until the jacket temperature rose to the cut-off point. As the stored and heated coolant was forced out of the water heater, and cold coolant replaced it, both tank thermostatically-controlled switches closed and continued to heat coolant during the pump's cycle of operation. With the pump shut down as jacket temperature maximum was reached, the two tank switches opened as their cut-off temperature gradient was reached.

As the coolant warmed under loaded-engine conditions, neither pump nor tank heaters drew current, except for the small amount of power needed to overcome radiation losses through the pipe and tank insulation.

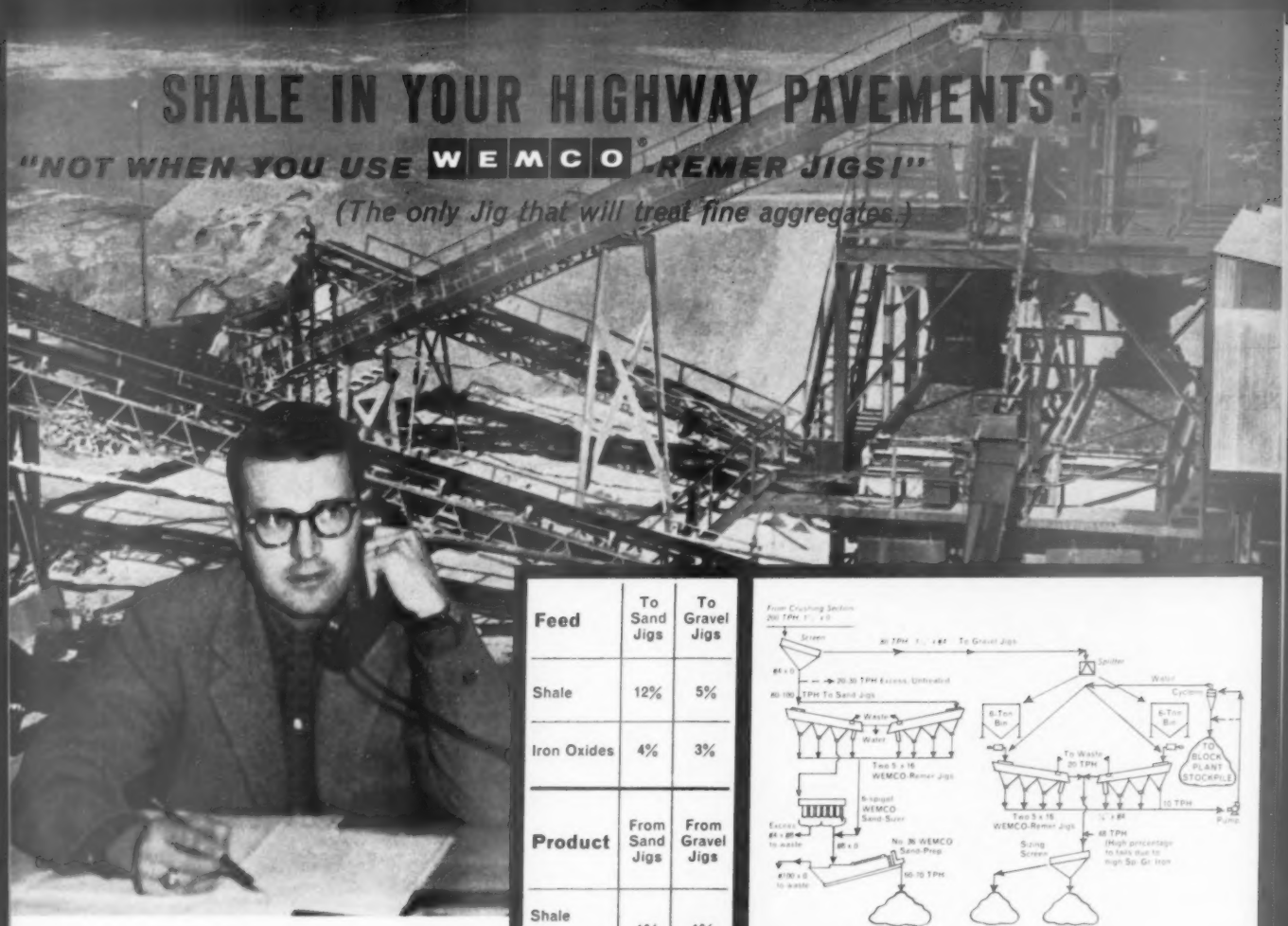
William Ammons, Oak Ridge, Tenn.

END

SHALE IN YOUR HIGHWAY PAVEMENTS?

"NOT WHEN YOU USE WEMCO® REMER JIGS!"

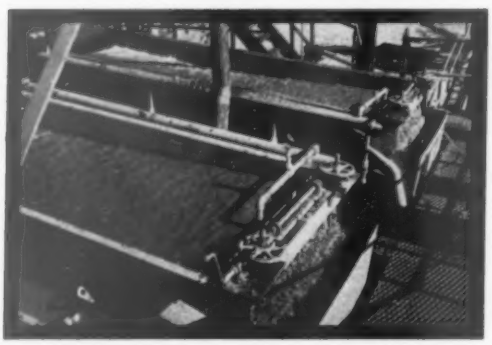
(The only Jig that will treat fine aggregates.)



John J. Simmons, Manager of Dakota Aggregates, Ironton, North Dakota reports:

Feed	To Sand Jigs	To Gravel Jigs
Shale	12%	5%
Iron Oxides	4%	3%
Product	**From Sand Jigs**	**From Gravel Jigs**
Shale	1%	1%
Iron Oxides		

"We could not meet highway specifications without the Wemco-Remer Jigs."



"These machines take a feed containing up to 12% shale and iron oxide and produce a product nearly free of unsound material. We have found that the long uninterrupted jig bed provides for a high percentage rejection of shales and light iron oxides which results in a very clean product. The rugged construction gives a low down-time operation while simplicity of design and ease of product control have enabled us to choose our operators from the nearby farm areas. We have become familiar with other types of jig units during our iron ore operation in Minnesota and Michigan, and we are satisfied that the Wemco-Remer Jigs have provided us with the results originally anticipated."

Need More information on Jig performance?
Talk to your nearest Wemco representative.

WEMCO®

a division of
Western Machinery Company
650 Fifth Street, San Francisco 7, California
Distributors throughout the world

THE WEMCO LINE OF QUALITY MACHINES FOR PROFITABLE AGGREGATE PROCESSING

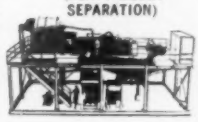
SAND-PREP WITH EXCLUSIVE LIFTING DEVICE

SAND-SORT

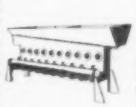
SAND-CLONE

ROCK & SAND JIGS

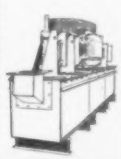
MOBIL-MILL (HEAVY MEDIA SEPARATION)



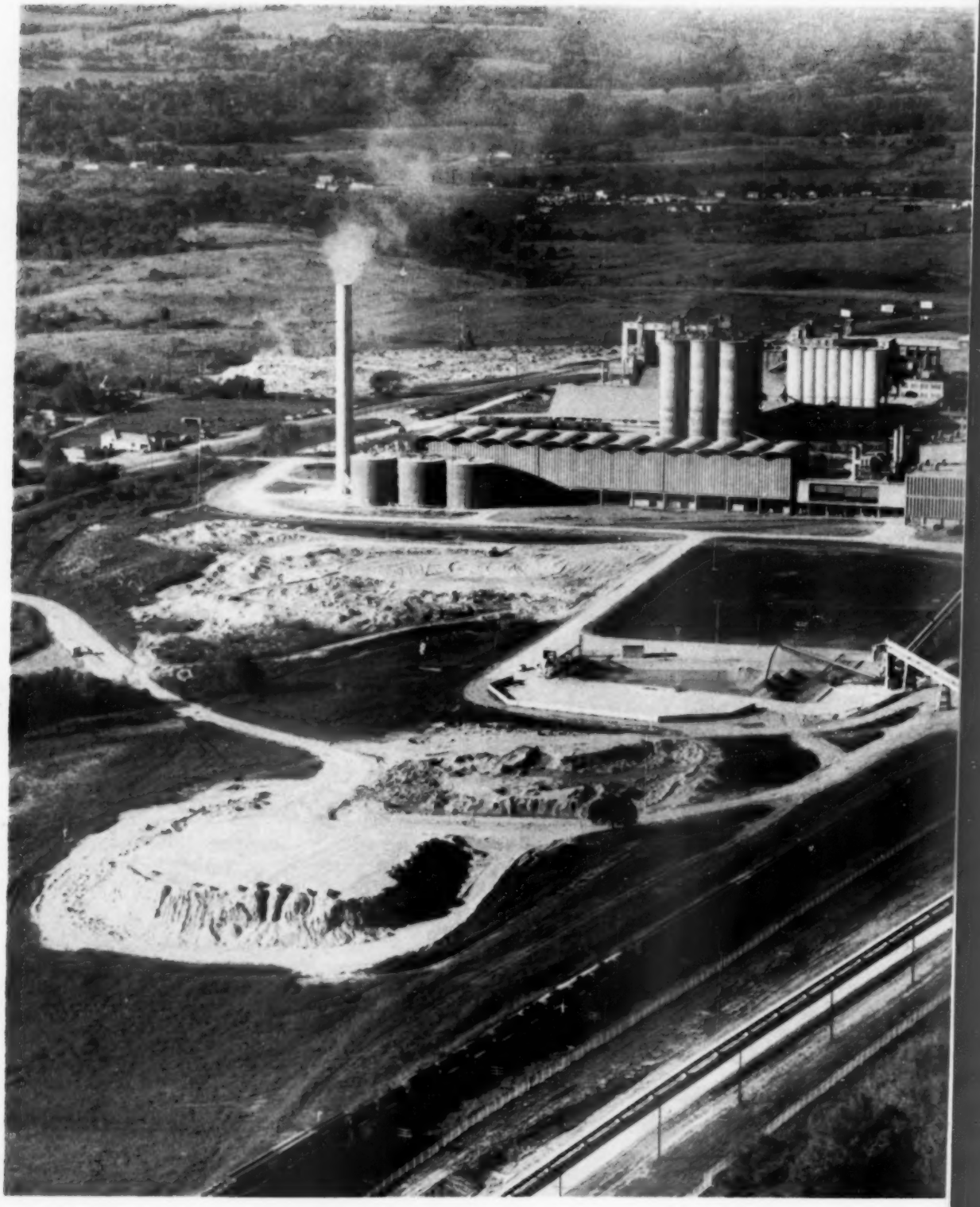
SAND-SIZER



SAND-SCRUBBER



PUMPS



WITH THE 3 MILLION BBL. NEW PLANT CAPACITY added to an old plant's potential at Ada, enough cement can be produced at this rail center to supply all of Oklahoma's normal requirements. A spectacular 5½-mi. belt conveyor system brings raw materials to the new plant

ROCK PRODUCTS
March 1960

One man controls two cement plants

by Elwood Meschter

STRAIGHTFORWARD SIMPLICITY characterizes the $20-million, two-kiln cement plant of Ideal Cement Co. at Ada, Okla. But the 3-million-bbl., wet-process installation has many features unusual in cement plants, which add greatly to its economy and efficiency.

- The world's longest permanent belt-conveyor system brings raw materials 5½ miles into the plant with bed-rock economy (see ROCK PRODUCTS, Jan. 1960, p. 134).
- The existing cement plant at Ada has not been dismantled. Instead, it is maintained on a standby basis, ready to go into production at short notice should market conditions require it.
- One-man, centralized control directs, records and controls the flow of materials from the quarry to the storage silos for finished products.
- Warehouses, shops, garage, substation and packhouse serve both new and old plants.

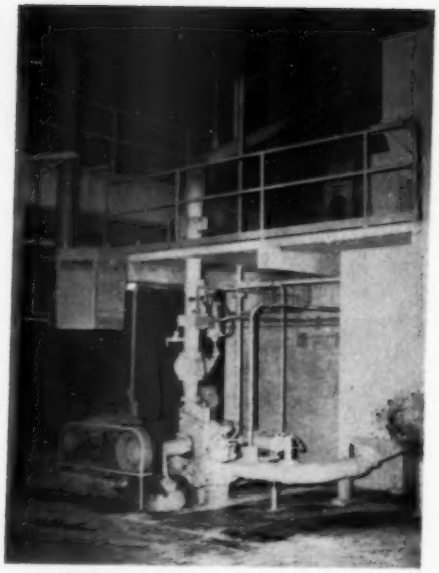
The new cement-making operation was built right next to the old plant to take advantage of the three railroads which intersect at Ada. This maintains the advantage of shipping bulk cement to all parts of the state. At the same time, both plants can tap the supply of all skilled cement workers in the neighborhood.

With the quarry 5½ miles away and two cement plants to supply, provisions have been made for storing raw materials near the plant and for auxiliary truck haulage.

More than 21,000 tons of shale can be stored in the shale soaking pit, ready to be pulled into one

Please turn page

BARREL-SHAPED ROOFS, channel-section curtain walls and soaring conveyors combine for a study in structural esthetics in a cement plant



A NUCLEAR DENSITY GAUGE provides the signal for kiln feed control

PRECAST CONCRETE channel sections were erected with interlocking flanges to form a louvered curtain wall for the mill building

ONE MAN CONTROLS TWO CEMENT PLANTS

continued from page 81

of four shale wash mills. A paved, walled storage area right next to the soaking pit can hold another 10,000 tons of shale, ready to be bulldozed into the pit at a moment's notice. If necessary in an emergency, shale could be hauled by truck directly from the quarry face to the soaking pit.

Normal operation of the cross-country belt system puts limestone onto a long inclined belt conveyor leading to silos which hold about 14,400 tons of raw material. An auxiliary truck-dump hopper with apron feeder and belt conveyor is always ready to supply the silos.

The storage silos can be reached through another system which normally brings in additives for cement making. A combination rail-truck hopper receives raw gypsum, iron ore and other raw materials. These are elevated to a belt-conveyor distribution system which discharges to interstices between the 38-ft.-diam. storage silos.

Preparation of raw materials starts at the shale soaking pits. Shale is put into one of four wash mills and agitated until it is pumpable. This suspension of shale in water is pumped to a 3,000-bbl. storage tank in the mill building from which it is metered into the ball mill with dry limestone.

When drawn from the 90-ft.-high storage silos with weighing belt feeders, limestone is put on a belt conveyor leading directly into one of two ball mills. A row of three silos serves each mill.

Kiln-feed slurry prepared by two 11 x 32-ft., two-compartment mills is about 80-percent limestone, 20-percent shale. The slurry is about 60-percent solids. This suspension is pumped to one of the three kiln-feed tanks, each holding about 10,000 bbl. of slurry . . . more than 36 hours' production from each of the mills.

Plant No. 1 is set up to receive kiln-feed slurry from these tanks, even though it is equipped to store shale slip and to make its own slurry.

Quality of the raw materials is checked continuously, often hourly. Fineness, density and calcium content of the ball-mill output are determined, and the necessary adjustments are made. Another determination is made of the slurry in the kiln-feed tanks before it is pumped to the ferris-wheel feeder at the feed end of each kiln.

A nuclear density control with 51 millicuries of cesium 137 operates continuously to sense and control the density of the material coming out of each ball mill. If the amount of water should exceed 40 percent, the control throttles the water added to the mill discharge. But if the density becomes too great, the water valve is automatically opened to bring water content back to 40 percent.

Slurry from the ferris wheel is dropped into a vortex which mixes it with recycled dust before it flows down the feed pipe into the kiln. More than half of the 200 tons of dust made each day is returned to this slurry feed.

Two dust collectors at the end of each kiln strip the dust from the 550-deg. F. exhaust gases. Each collector is made up of a cyclone section which takes out about three-fourths of the suspended dust, and an electrostatic section to remove virtually all of the suspended solids.

From the collector hoppers, dust is elevated by a screw-conveyor system to the top of a bin. There, a three-way chute can be regulated to load one or both screw conveyors leading to a vortex where dust is mixed with slurry. Overflow falls directly into the dust bin, from which it is pumped to a fill area with a pneumatic conveyor. Gates are available, however, for truck loading to haul away excess dust.

The two 12 x 450-ft. kilns are gas fired. Turning at 80 rph., each uses about 5 million cu. ft. of natural gas every 24 hr. Each is equipped with a television camera. Monitors in the control room keep an operator informed of conditions deep in the kilns, so he can make whatever changes are indicated.

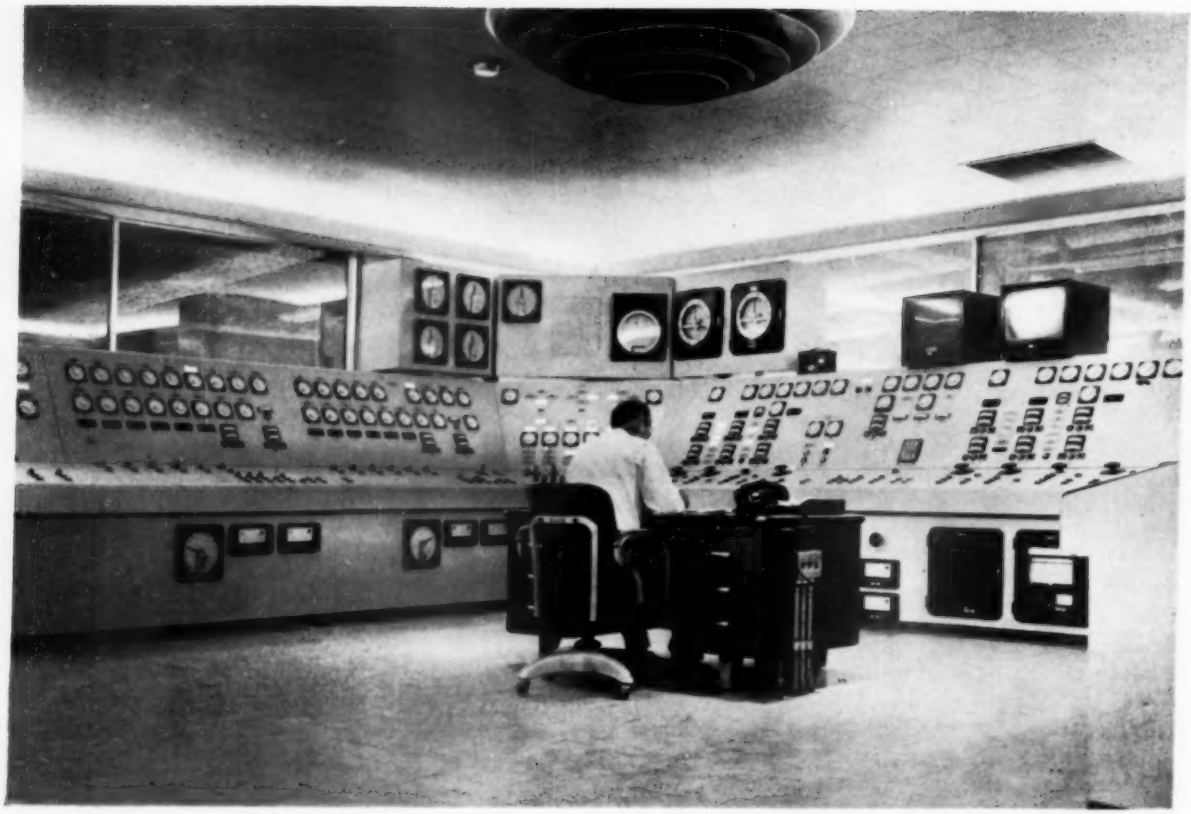
Each kiln discharges clinker to a 6 x 100-ft., air-quenching cooler. The coolers discharge to a pair of parallel oscillating conveyors. Normally, one clinker-handling system takes the output from both kilns. The other system—conveyor, elevator and distributing belt—is maintained as a standby.

Excess air which is not drawn into the kiln from the cooler is put through cyclone dust collectors. Dust from these collectors joins the flow of clinker going to storage on a belt conveyor.

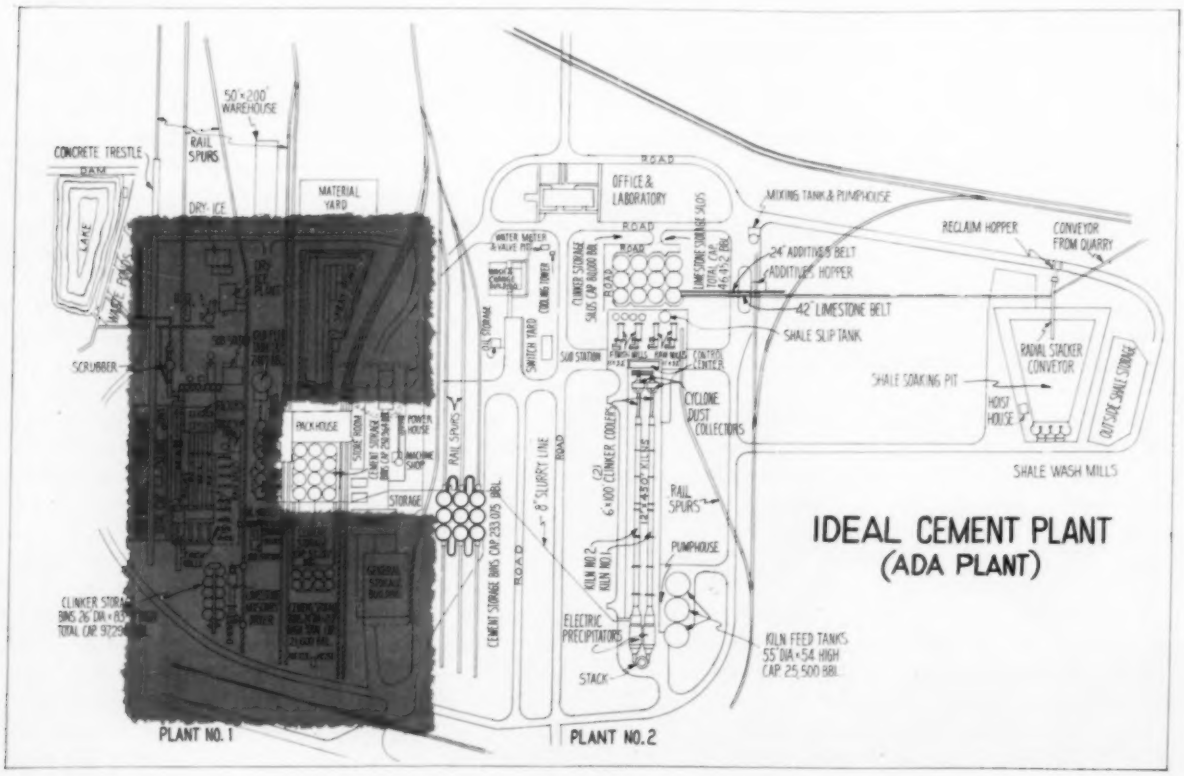
Clinker is stored in one of six 38 x 90-ft. silos in the same cluster of concrete storage silos as the raw-material storage system. Here, too, each row of three silos serves each ball mill. Gypsum is stored in the interstices and is drawn to the conveyors with weighing belt feeders.

The two finish mills are substantially the same as the raw mills, each 11 x 32 ft., driven by a 2,000-hp. motor. Each mill discharges to a bucket elevator which lifts ground clinker and gypsum high over the mill floor and sends them to one of a pair of 16-ft. air separators. Oversize is dropped back to the mill, while accepted cement is pumped to storage.

Please turn page



ABOVE: Straight forward, straight-through flow of materials from quarry to packhouse is supervised by one man in a central control room



ONE MAN CONTROLS TWO CEMENT PLANTS

continued from page 83

Each of the four mills in the milling department is equipped with a device that will stop it in a position with manholes at the top. Position A permits stopping with closely-spaced manholes up, and position B, with widely spaced manholes at the top. A "magic ear" regulates the flow of material into each mill on the basis of the relative noise level inside it.

Finished cement is stored in one of nine 36 x 136-ft. concrete storage silos and four interstices —a total capacity of 233,000 bbl. Three of what may well be the largest scales ever made serve the three rows of silos. The rail-car scales are 140-ft. long, with a capacity of 150 tons each. Cars are loaded by gravity; four cars can be loaded, weighed and dispatched every hour.

The straightforward flow of materials through the plant can be attributed in some measure to the judicious use of concrete construction materials.

The belt-conveyor system from the quarry is supported by 48-in.-wide by 50-ft.-long prestressed concrete channels. Prestressed concrete beams, nearly 100 ft. long, support the conveyor on long-span bridge sections, while prestressed concrete columns support these sections.

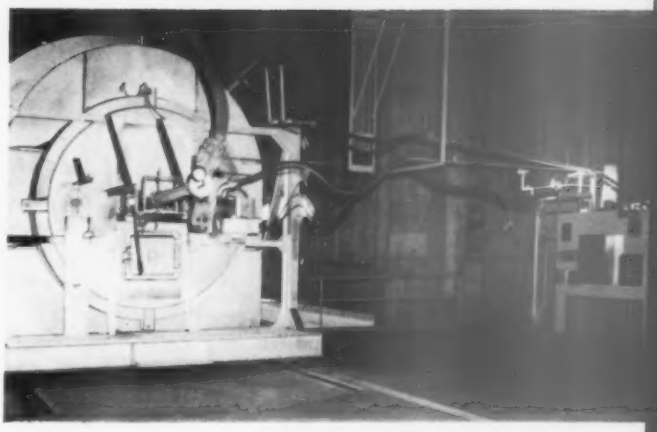
All roof beams and walkways are prestressed sections, as are the double T's used for the roofs of the mill buildings and storage silos.

Conveyor supports on the cross-country belt are mounted on precast, reinforced concrete saddles. Curtain walls on the mill building are made of precast channels. These were assembled vertically, alternately facing in and out. The clearance between the flanges effectively keeps out rain and snow, at the same time letting outside air circulate freely through the building. The long mill building is roofed with barrel-shaped thinshell concrete sections only 4 in. thick.

The three 55-ft.-inside-diam. x 54-ft.-high, kiln-feed tanks are of combined slip form and prestressed concrete construction. Each tank was constructed with conventional concrete slip forms, 8½ in. thick, with standard reinforcing. As the forms were slipped, the tank was wrapped with .162-in. diam. wire under 140,000-psi. tension and covered with gunite.

Three layers of wire were wrapped around the tank, and the finished thickness was about 1¼ in. These wires were closely spaced near the bottom of each tank to concentrate the stress there. Final tension in the wire is estimated at 104,000 psi.

With the new plant in full operation, cement-producing capacity at Ada will have been nearly doubled, to 5½ million bbl. "This is more cement than has ever been used in Oklahoma in a one-year period," said M. O. Matthews, executive vice president, when he lighted the fire for the first kiln October 23, 1958.



A TELEVISION MONITOR lets the operator in the distant control room supervise kiln firing

Plant manager of Ideal's operation in Oklahoma since January 1954 is David O. Howe, who started with the company in 1947 as project engineer at Ada. The man largely responsible for the design and construction of the new plant is Ideal's chief engineer, George Wiley, whose offices are located in Denver. **END**

MAJOR EQUIPMENT REFERENCE

Radial stacker belt	Coastal Plains Supply Co.
Belt conveyor system	Coastal Plains Supply Co.
Shale wash mill	Oil Well Supply Div. U. S. Steel Corp.
Shale drag system	Sauerman Bros., Inc.
Shale slip mixer	Dorr-Oliver, Inc.
Kiln-feed slurry mixers (3)	Dorr-Oliver, Inc.
Ferris wheel feeders (2)	Ideal Cement Co.
Weighing belt feeders (18)	Merrick Scale Mfg. Co.
Clinker belt scales (2)	ABCs Scale Div., McDowell Corp.
Ball mills, 11 x 32-ft. (4)	Allis-Chalmers Mfg. Co.
Kilns, 12 x 450-ft. (2)	Allis-Chalmers Mfg. Co.
Coolers, 6 x 100-ft. (2)	Allis-Chalmers Mfg. Co.
Oscillating conveyors (2)	Carrier Conveyor Corp.
Bucket elevators (7)	Chain Belt Co.
Kiln dust collectors, cyclone (4)	Buell Engineering Co., Inc.
Kiln dust collectors, electrostatic (4)	Buell Engineering Co., Inc.
Cooler dust collector, cyclone (2)	Buell Engineering Co., Inc.
Dust collectors, bag type	Northern Blower Co.
Air separators, 16-ft. (4)	Sturtevant Mill Co.
Slurry pumps	A. R. Wilfley & Sons, Inc.
Nuclear density controllers (2)	Ohmart Corp.
Mill motors, 2,000-hp. (4)	General Electric Co.
Pneumatic conveyors	Fuller Co.
Storage silos, cement	Fegles Construction Co.
Storage silos, mill dept.	Secor Construction Co.
Shipping scales 150-t. capacity (3)	Fairbanks-Morse & Co.
Television monitors (2)	Diamond Power Specialty Corp.
Consulting engineers	Vern E. Alden Co. Ken R. White

Part 2*

Autoclaves and architects team up to solve production and design problems

Lightweight aggregates penetrate block market

by Kneeland A. Godfrey, Jr.

WHAT IS IN THE CARDS for lightweight aggregates? Prosperous times, new markets, increased sales? Time will reveal its secrets, but meanwhile, we like to try telling its fortune. Here we will rely, not on a crystal ball, but on sales charts, market data and the word of producers.

Concrete block, the market into which is poured 85 percent of lightweight aggregates produced, has a definite bearing on the industry's future. We've talked with both block and lightweight aggregate producers, asking them how they achieved their present success and what the outlook is. Other material was supplied by the ROCK PRODUCTS research department and by the staff of CONCRETE PRODUCTS magazine.

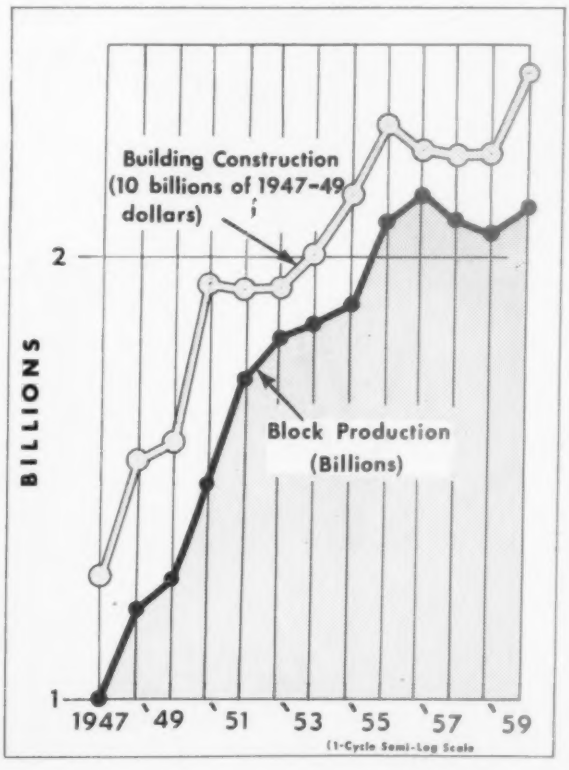
Block sales depend on building construction—the parallel is very close, as the graph shows. Historically, since the war, both experienced rocketing gains through 1950, a lesser but still strong growth rate since. The construction boom years of 1950, 1955 and 1959 show up clearly as peaks on the building construction curve.

What we really need is a forecast of block sales—where is this important industry going? No authoritative long-range block sales forecasts are made, and none for building construction for more than one year ahead. But there is a clue in the number of U. S. households forecast up through 1980 by government statisticians. The forecasts were based on assumed future birth rates.

Compare the net increase in households with nonfarm dwelling units built each year, as shown on the second graph. The parallel here is remarkably good. When a big net increase in households was registered in a given decade, many new homes were built.

Please turn page

BLOCK PRODUCTION parallels building volume



*See Part 1, *Lightweight aggregates come of age*, November 1959 ROCK PRODUCTS, page 83

UNIVERSITY OF CALIFORNIA's new Santa Barbara campus is tastefully done in cinnamon block, with white accents. Special block was created for noted architects Pereira and Luckman. It's typical of the best new designs in block

LIGHTWEIGHT AGGREGATES PENETRATE BLOCK MARKET

continued from page 87

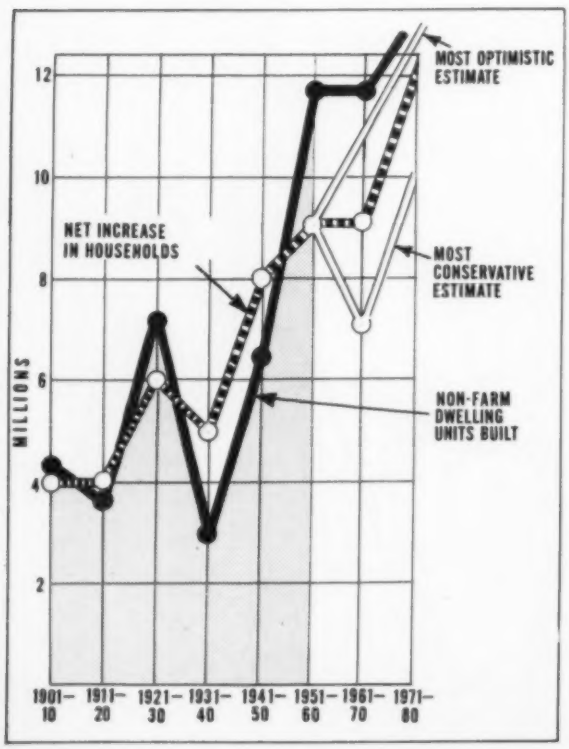
One interesting point shows up on the nonfarm dwelling units' curve. It varies more widely than net increase in households; it rose sharply with the boom of the Roaring Twenties, was down sharply in the Thirties (Depression) and Forties (World War II).

Let's make a housing forecast, using this basis. Taking the middle estimate for net increase in households, and assuming that new dwelling units will keep pace, about 1.15 million a year will be built during the Sixties and perhaps 1.45 million a year during the Seventies. This compares with 1.15 million built yearly during the Fifties, a figure far higher than for any earlier decade. Reason the Sixties may not top the Fifties: the past decade was a period of "catch-up" after 20 years of war and depression, when few could afford to build homes.

(A forecast by F. W. Dodge Corp. figures dwelling units will be built at an even faster pace—1.3 million a year in the early Sixties, and higher thereafter.)

Using the estimate of 1.45 million new dwelling units yearly by the 1970's, block sales for homes should rise a like amount (21 percent) to perhaps 900 million a year. At present, 740 million block a year, or 32 percent of U. S. block production, goes into homes, a CONCRETE PRODUCTS magazine survey shows.

HOUSING follows households increase



Actually, lightweight block seem sure to gain faster in use than total block sales, since the lightweights are steadily gaining a larger share.

One authority, Cedric Willson, engineering vice president for big Texas Industries, expects that "by 1965 lightweight block will account for 75-80 percent of the total block market." His firm's nine busy 3-at-a-time block machines make only lightweight units for the Texas-Louisiana market. And this is generally true for most producers in the area. At present about 65 percent of national block production uses lightweight aggregates (the 1954 U. S. Census of Manufactures pegged the figure at 60 percent).

Two top reasons why lightweight block will gain increasing acceptance: It is much easier for masons to handle, and often cuts building costs because it is a superior thermal insulator. Both these points were made in Part 1 of this series (see ROCK PRODUCTS, November 1959, p. 82). In brief review, masons much prefer to work with 27-lb. lightweight block rather than 40-lb. natural-aggregate units. With labor cost a vital consideration on every job, architects and builders will go far to please their workers.

Second, lightweight block helps cut heating, insulating and even fire insurance costs, compared with natural-aggregate block. While its higher first cost (national average: 26¢ vs. 22¢) partly cancels out this advantage, lightweight block walls can be up to 25 percent thinner and still have fire ratings equal to walls made with natural-aggregate block. They have up to a third lower coefficient of heat transmission. Translated by architects: lower heating and insulating costs.

In just one property vital for wall materials—sound absorbency and reflectivity—does lightweight block have no advantage over its heavier brother? The amount of sound reflected back into a room from a wall depends on its surface, not the block's density. Both lightweight and heavyweight block may be made with very absorptive surfaces (absorb 60 percent of the sound and more) or with reflective surfaces (absorb less than 20 percent). These figures are reported in PCA's "Concrete Masonry Handbook." Because they can be made very absorptive, both types of block are popular for interior walls of offices and schools.

Sound transmission loss through a wall is actually better (greater reduction) with heavyweight

Please turn page

HERE IS BLOCK'S COMPETITION—curtainwall materials which require less labor for erection. Precast concrete is gaining in popularity, as are curtain walls of aluminum, steel

LACY WHITE SCREEN BLOCK lend sparkle to the new offices of the National Concrete Masonry Association in Washington, D.C.

NEW BLOCK MARKET—floor and roof systems—holds promise because they require no formwork (precast joists take care of that). Too, the block have openings for utilities in floor. Once block are all in place, thin concrete surface is poured, tieing system together

LIGHTWEIGHT AGGREGATES PENETRATE BLOCK MARKET

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block. The following figures are reported in NCMA's "Sound Reduction Properties of Concrete Masonry Walls."

SOUND TRANSMISSION LOSS THROUGH WALLS
(4-in. hollow units; no surface treatment)

Aggregate	Av. Reduction	Dry Block Wt.
Cinder	37.6 decibels	16.1 lb.
Expanded Shale	34.7 decibels	16.3 lb.
"Dense"	42.7 decibels	24.8 lb.

Gains in quality and appearance over the past decade or so account for a major share of sales growth of both lightweight and natural-aggregate units. Block sales have more than doubled since 1947, to an estimated 2.3 billion units this year.

The quality hurdle was the first one the industry faced. Briefly, its product had two serious drawbacks—shrinkage cracking and "sweating" of walls.

Cracking was licked when producers learned to get the moisture content of the finished block down to that of the air before use. Block always shrink upon drying, expand when wetted. Today producers supply dry block; too, architects design block walls with provision for some expansion and contraction (occurs even with dried units) at control joints.

Cold, damp, sweaty block used to make the material unsuitable for interior walls; ugly white streaks, caused by leaching out of lime in the block, often formed on the wall. Today, outside surfaces of block walls are carefully waterproofed to eliminate moisture movement. And, block are now more fully cured, minimizing free lime.

The appearance hurdle has been solved recently, too, by putting new varieties of block in architects' hands. Good designers no longer have trouble avoiding the "warehouse" look with a block wall. Many of the more progressive architects are even using block in homes, in both exposed interior and exterior walls.

Three new breeds of block ease the architect's job—units come in new assorted colors, sizes and surface patterns.

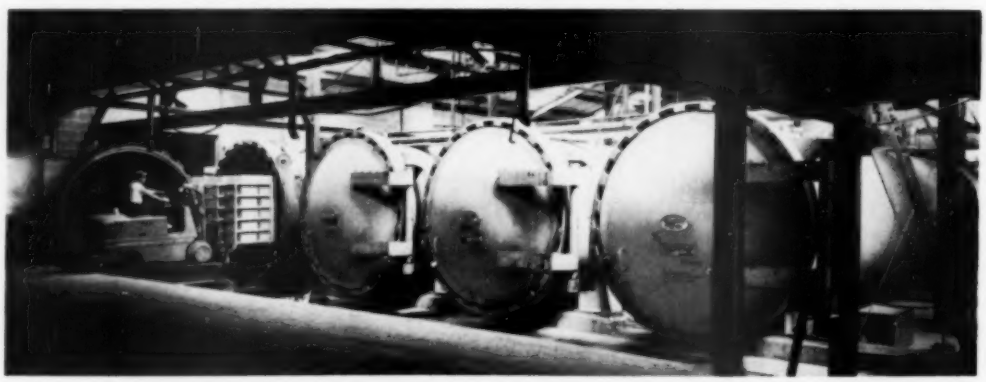
Size variations in the standard 8 x 8 x 16-in. unit are one of the very best ways of boosting sales for exposed use, one southwestern producer advises. He's found the half-height unit, with 4 x 16-in. exposed face, wonderfully successful. Enough for 55 homes are sold daily! Carefully handled by the designers, the half-height unit doesn't have the warehouse look, is a moderate-cost item with a distinctive appearance.

Interesting surface treatments—from split-block through Shadowal to veil block—are other ways to create attractive block walls. Split block is a sort of "Siamese" unit which is broken in half after curing. The resulting rough surface has a popular, natural appearance.

Shadowal and Hi-Lite block are two examples of new designs having raised or lowered portions on the exposed face. Used intelligently, they make pleasing patterns, add drama to buildings.

Colors in block may be integral, surface- applied at the block plant, or may be painted on the finished building. Today, some producers offer block with a colored, glazed surface which competes effectively with clay tile for interior use in offices and schools. These three new varieties of block—in new sizes, with improved surfaces and decorator colors—are doing a lot to build sales. So wide is the choice of block wall designs that variety is limited only by "the imagination of the designer," one building magazine writes.

Where is concrete block used? When analyzed by type of building, 34 percent of block production goes into stores, offices and factories; 32 percent into dwelling units; 25 percent into public and institutional building; and 9 percent into other types. CONCRETE PRODUCTS magazine turned up these figures in a recent survey.



AUTOCLAVES, for high-pressure steam curing, typify quality control and mechanization now common in the industry. Autoclave curing, plus drying, helped solve the cracking bugaboo

Speaking of the industrial-commercial category, Henry Toennies, assistant engineering director of National Concrete Masonry Association, pins large hopes on it. Lightweight block especially is "ideally suited" to the curtain-wall designs now so popular in tall buildings, he admits, because of its low dead weight.

Turning to residential construction, Mr. Toennies proclaims that block is "no longer considered suitable only for foundation walls and backup," for the public is getting a new mental image of block as a quality wall material. "The return of the house with a basement" is helping boost sales in this area, Mr. Toennies concludes.

Talking about the residential market, Editor William M. Avery of CONCRETE PRODUCTS pinpointed the South and Southwest as areas in which block producers have had better than average success in selling block for homes. In Florida, a serious termite problem and the hurricane threat are two reasons builders favor block—it withstands both better than frame homes.

But these problems aren't found in Arizona, where block also is highly popular. Why is it so popular there? One strong answer is found in the type of home Arizonans favor—modern, ranch style. While stone, brick and wood are traditional for the more conservative northern homeowner, the new Arizona resident uses block freely. It fits in with his modern, casual-living mood. Too, the Arizona block producer makes the size the builder wants—4 x 8 x 16-in. units. He doesn't try to force a given size (usually 8 x 8 x 16) on builders, but asks what size they would like to have.

A new market—floor and roof systems—is opening up for progressive block producers. This promises to be a big market, since in buildings with 2,000 sq. ft. or larger floor area, more block can be used in the floor than in the walls. While the market is still modest (20 million sq. ft. in 1958, by one estimate), the promise is there.

The market looks particularly good for lightweight block. Reasons given by the producer of one block floor system: Lightweight block reduce handling and shipping costs because of their lightness; reduce cost of supporting structures, and have better thermal insulating properties.

Any dark clouds on block's horizon? we asked producers. Biggest problem needing solution, they respond, is growing labor cost for laying up a block wall. Masons' wage rates are rising fast enough to threaten block's edge in cost of finished walls.

One producer identifies "precast and prefabricated wall sections of competitive materials" as the chief reasons he doesn't expect increased sales this year. These materials often have lower in-place cost because they require less labor.

Cedric Willson of Texas Industries reports that block's future depends critically on "the increased cost of laying units in the wall. Unit masonry is laid in a wall by virtually the same technique today that was practiced 25, 40 or 50 years ago." Other wall materials requiring less construction labor have, as a result, become competitive. "This may have a serious effect on the growth of the lightweight block industry," warns Mr. Willson.

Block producers have been remarkably successful in holding down the price of their product, if not the cost of laying it in a wall. Block prices rose only 19 percent in the 1947-57 decade, while cost of the average building material rose 88 percent. Why? This was a decade of switching from hand methods to mechanized production of block.

The 1947 and 1954 U. S. Census of Manufactures give these facts: During these seven years, while total block production jumped from 1 to 1.8 billion units, the number of plants dwindled from about 4,200 to 2,300. END

HANDSOME Arizona home of half-height block indicates the acceptance gained by this size unit in the Southwest. With a 4 x 16-in. exposed face, the block don't have the "warehouse" connotation associated with other block, actually look like large brick

This sand and gravel plant's network of 29 conveyors, 7 screens, assures flexibility, high volume and material specs. for exacting market

MATERIAL SERVICE PACES CHICAGO'S GROWTH

by Elwood Meschter

LATEST ADDITION to the life-stream of thriving Material Service Corp. is its East Dundee, Ill., sand and gravel plant. It was built as part of the company's program to maintain its rate of growth in the voracious and expanding metropolitan markets for aggregates in northern Illinois. The East Dundee location is particularly advantageous: not only is it near the growing industrial complex in the Fox River Valley, it also adjoins the mushrooming suburbs north and west of Chicago.

The gravel deposit in the 250-acre tract was under 2 to 5 ft. of rich Illinois farmland. But the fertile loam was carefully stripped and thriftily stockpiled to provide another lucrative source of revenue. Gravel depth ranges between 45 to 55 ft. Content averages about 65 percent minus 12-in. gravel and 35 percent sand.

Primary capacity of the setup is well in excess of 400 tph. of standard products. It's a flexible arrangement which permits production of a wide range of individual specifications, as well as precise gradations of sizes within standard specs.

Generally, gravel production consists of Illinois grades 2 and 7, sizes A and B, class X and pea gravels. Only one grade of sand is made—a mixture of natural sand with crusher fines. When additional sand is needed—as the specifications call for additional fines—pea gravel is crushed and recycled to the sand system.

There are three distinct processing systems in the entire plant: (1) a dry system to make subbase or "traffic bond" materials; (2) a gravel washing system, and (3) a sand washing section. Between the dry and the wet sections are a pair of cone crushers which can be individually cut into the road-base circuit whenever additional crushing capacity is needed.

These processing systems are tooled up with seven vibrating screens and four crushers, all linked in a network of 29 belt conveyors. Five of the screens are double-deck units—two are 3-deck screens. Several screens have hand-operated gates that divert flow of through-screen material from one circuit to another, while some units have splitter gates that let the operator divert only part of the stream of aggregates over the decks.

Size separation starts in the gravel pit. There, the truck loading hopper is fitted with a steeply inclined grizzly that lobs off plus 12-in. boulders. An electrically operated, 4-cu. yd. dragline keeps the field hopper full of material so there's no delay in loading the pair of bottom-dump trucks. Two pneumatic gates in the fieldhopper bottom are operated by the truck driver; he regularly puts on 26-ton heaped loads for the short haul to the truck-dump hopper.

Second sizing is done at the dump hopper, where a grid scalps off boulders which may have worked through the field grizzly. A vibrating feeder under this hopper meters material to a 36-in., horizontal belt conveyor. The speed of this feeder is supervised by an operator who observes the volume of the recycling material and regulates incoming raw gravel accordingly.

All aggregates are first put over a 5 x 14-ft. scalping screen, with all oversize dropping to the maw of a 30 x 42-in. jaw crusher. This screen determines the acceptable top size of the sub-base

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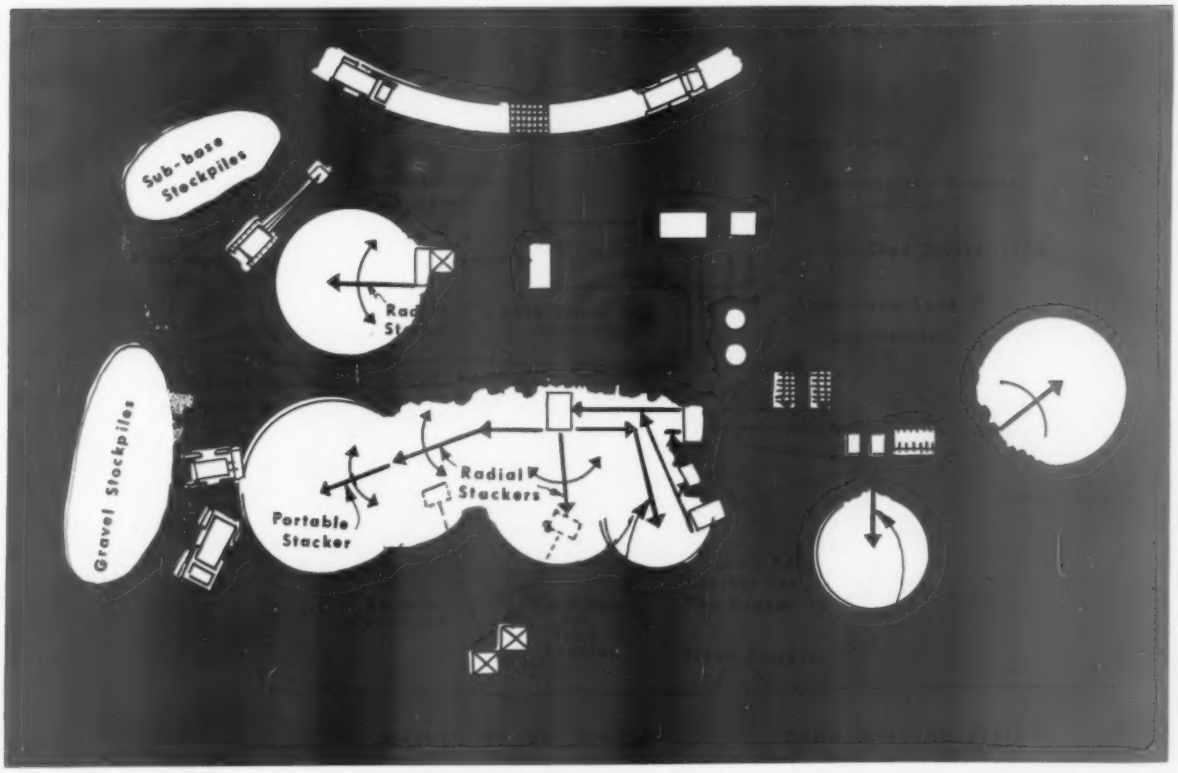
RAW GRAVEL coming from truck dump hopper on a wide belt conveyor, first of 29 in the East Dundee plant

FLOW OF MATERIAL through sand and gravel processing system at East Dundee, Ill., plant of Material Service Co.



FIRST RECYCLE SYSTEM sets the specs. of the roadbase materials which are stored off to the left

SCALPING SCREEN takes off heavy gravel to be reduced in the primary jaw crusher before gravel is sent to the roadbase system or to the gravel washing plant

A PAIR OF SCREENS separates sand from pea gravel which is either stockpiled to the right or recrushed to fines

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materials by the screen cloth on the lower deck. This screen has 1½-in. openings on the first section which drops material to the belt taking crushed material back to the sub-base system. Here a second screen takes out material to be recycled. Second section of the scalping screen takes minus 2½-in. material to be sent on to the gravel washing system.

Material retained on the lower deck of the scalping screen is conveyed to one of two cone crushers. A short conveyor under both crushers brings crushed gravel back to the recycle belt conveyor. A flop gate in the scalping screen's discharge chute lets the operator divert the material from the top deck to the cone crusher belt and thus by-pass the jaw crusher.

Controls for the sub-base circuits are located in a screening tower which overlooks the area. The operator can both observe raw feed coming into the system and see the volume of material being recycled to make adjustments in the rate of flow. The road-base system can be operated independently of the rest of the plant. It is a dry setup; therefore, it can be operated during the winter when low temperatures would freeze up the washing system.

Sub-base aggregates passing through a 4 x 14-ft. screen are conveyed to a truck-loading hopper. Trucks are loaded two at a time from this bin—one from directly beneath, another from a short screw conveyor projecting to the side. Here water is added and mixed to load out a product with up to 10 percent moisture.

Overflow chutes to the foot of a radial stacking belt which builds up stockpiles for a 1¾-cu. yd. clamshell crane to load out. The crane supplements the stockpiling and loading work of a front-end loader by filling truck-loading field hoppers spotted around the plant.

During the first few months of operation, the stockpile area for sub-base aggregates has proven to be inadequate. Eventually, the radial stacker will be replaced with a fixed conveyor, and the storage area will be extended. In this way another size or two can be piled without excessive rehandling.

As mentioned earlier, when small sizes of unwashed aggregates are required, one or two cone crushers are added to the circuit. One is a 4¼-ft. standard unit which takes material from the lower deck of the scalping screen above the jaw crusher. Crushed gravel is dropped to a short belt conveyor which collects from both cone crushers.

The second unit is a 4-ft., shorthead cone which can be supplied only from a 5 x 14-ft., three-deck screen—first unit in the gravel washing system. Normal operation of this screen sends oversize to the cone crusher, but the product from the crusher can be put into the sub-base circuit or can be recycled back to the top of the big screen and wind up in the gravel washing system.

Gravel washing begins when the products from the lower decks of the screen are taken to a pair of 25-ft. long double-log gravel washers. But it is possible to send these aggregates to gravel storage without washing. Through-screen fines are normally sent to the sand washing system, but they, too, can be sent to storage with gravel.

A long belt conveyor that travels through the plant picks up washed gravel from three sources. First, it gets material from the log washers as it passes under the triple-deck screen on its way to a rinsing screen. Then it picks up oversize gravel rejected by the two screens in the sand circuit. Further on it collects the oversize from a vibrating screen above the pea gravel crusher. All these washed gravels are finally separated on a three-deck vibrating screen, and the three products are stockpiled. This screen is fitted with water sprays to rinse off the last traces of sand. Through-screen tailings are sent to a pond to join tailings from the sand washer and the gravel log washer.

Two sizes of gravel are stockpiled over reclaim tunnels with radial stacking belt conveyors; one size is stored with a fixed-belt stacker, and a fourth size also can be stored. This is done by wheeling up a portable belt conveyor to the end of one radial stacker. It puts gravel well beyond the material over the reclaim tunnel.

The two reclaim conveyors bring gravel to truck-loading hoppers. Each of the steel bins has three chutes on about 5-ft. centers and has manually operated duplex gates. The special, long dump truck bodies used by Material Service are loaded and trimmed rapidly when three gates are discharging material. It takes only a few minutes to put 20 to 25 tons of gravel into an end-dump truck which could easily haul 30 tons or more. High level controls on the bins operate automatically to keep them full at all times. When material falls below the control, it starts the conveyor in the reclaim tunnel; it is stopped only when material again rises about the control.

A huge front-end loader with a specially designed 4-cu. yd. bucket moves from one part of the plant to the other to fill trucks with the aggregates not handled from one of the two reclaim tunnels. With a carry-capacity of about 7 tons, this fast-moving machine is one of the largest units of

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MATERIAL SERVICE PACES CHICAGO'S GROWTH

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its kind ever built. It often fills one of Material Service's red and yellow trucks to a road-limit load in three passes. In addition to loading trucks in any part of the big plant at a moment's notice, this loader is used to build or reshape stockpiles of aggregates.

Sand washing starts with a pair of 5 x 14-ft., double-deck vibrating screens. These units handle 140 tph. or more of natural sand and crusher sand mixed together. Through-screen sands drop down to a double-screw washer, then are taken to storage on a belt conveyor system. The final radial stacker puts material into a stockpile to be reclaimed by the front-end loader or to be put into a field hopper by the clamshell crane.

Oversize from the sand washing screens can be sent in three directions. Material from top deck, lower deck or both can be directed to a fixed stacker immediately in front of the screen tower. When additional sand is needed, these fractions go to a screen above a 24 x 54-in., double-roll crusher.

Third alternative is to send oversize from the sand washing screens back to the gravel system. The belt conveyor chutes it either into the gravel washing conveyor or into the long conveyor serving the gravel storage system.

All controls for the sand and the gravel washing systems are placed in the tower above the pea gravel crusher. This high tower is in the center of the washing area, strategically placed for observation of the screens and conveyors.

Through-screen pea gravel drops into the smooth rolls of the crusher, and the fines are recycled to the sand washing screens. A flop gate in the chute off the top deck gives the operator a choice: he can send part or all of the oversize down to the crushers. In this way he can maintain the volume of crushed sand at a maximum without overloading the crusher with coarse material. Oversize from the pea-gravel screen, as already mentioned, is conveyed to the gravel storage belt conveyor.

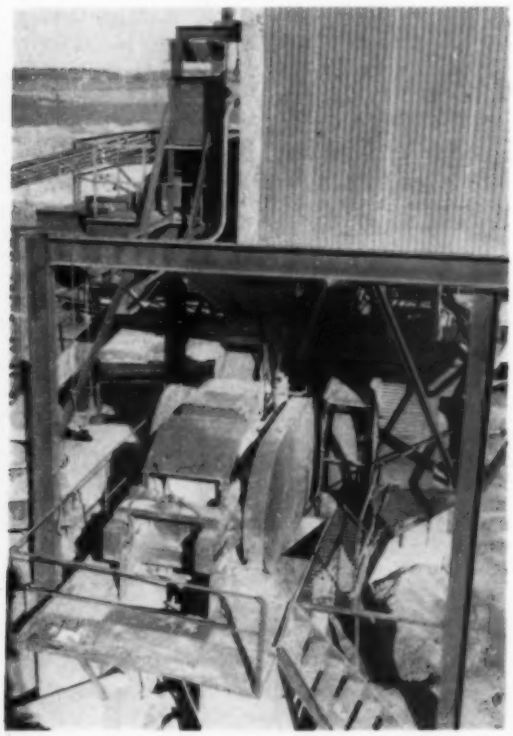
This plant is nearly self-sufficient, even though shops and skilled workmen from the Chicago area are within calling distance. Nearly all maintenance and repairs—except a major breakdown—are taken care of in a garage and shop tooled to service trucks, front-end loader, conveyors, grader and clamshell crane.

In this way maintenance costs can be collected and evaluated, and the production plant becomes a testing ground for production performance and service expense of each piece of equipment. When Material Service expands or retools its far-flung organization, it has the information needed to make a selection of the equipment.

It was on this basis that the giant front-end loader was selected, rather than several smaller units. It was on this basis that a road grader was purchased—a capital investment to cut down haulage maintenance expenses.

A testing laboratory keeps one man busy full time. Samples are taken hourly from each production circuit. Based on sieve and screen tests, recommendations for changing screen cloths or crusher settings can be made and rechecked. **END**

PEA GRAVEL is reduced to fines in a double-roll crusher to fill in sand specs.

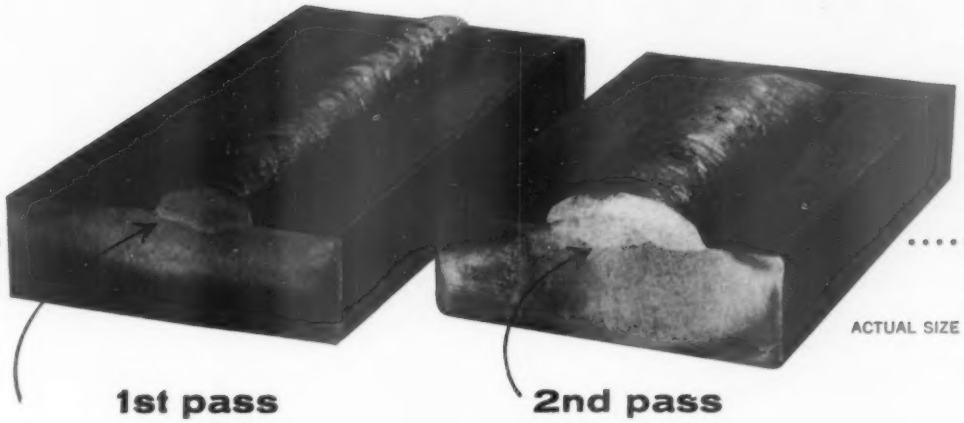


MAJOR EQUIPMENT REFERENCE

Belt conveyors (29)	Barber-Greene Co.
Haulage trucks (2), 22-ton	Euclid Div., GMC
Dragline, 4-cu. yd. electric	Marion Power Shovel Co.
Dragline, 1¾-cu. yd. diesel	Link-Belt Speeder Corp.
Vibrating screens (7)	Allis-Chalmers Mfg. Co.
Jaw crusher, 30 x 42-in.	Pioneer Engineering Div., Poor & Co.
Double-roll crusher, 24 x 54-in.	Pioneer Engineering Div., Poor & Co.
Cone crushers, 4¼-ft. std., 4-ft. sh.	Nordberg Mfg. Co.
Double-screw sand washer, 36-in. diam.	Eagle Iron Works Co.
Double-log gravel washers (2), 25-ft. lg.	McLanahan-Stone Corp.
Vibratory feeder	Jeffrey Mfg. Co.
Steel bins (6)	Butler Bin Co.
Front-end loader, 7-ton	Frank G. Hough Co.
Road grader, T-500	Galion Iron Works & Mfg. Co.
Shipping trucks	Autocar Div., White Motor Co.
Dump bodies, 30-ton	Anthony Co.
Plant layout and design	Material Service Corp.

STOODY BUILD-UP

(Iron Powder Coating)



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Barge-mounted HMS system now taps Ohio River's marginal aggregates

Dravo's new dredge wins bravoes

JUST LIKE THE MEAT PACKERS who use everything but the "squeal" from their porkers, Dravo Corp.'s new Dredge 16 is getting every usable fraction from river-bottom gravel deposits. By using both a crusher and a heavy-media plant, the 500-tph. unit does two things its predecessor could not. First, it can make good aggregate from gravel up to 6 in. Second, some lower quality deposits so common along the Allegheny and Ohio Rivers can be beneficiated to meet specs.

Dredge 16 replaces a 35-year-old, 350-tph. unit which was forced to hunt for "ideal" deposits which it could process efficiently. This material was difficult to market at best. Its rotary screens were not the most efficient; its lack of spare power made it impossible to rehabilitate it economically.

A strict set of requirements was met in designing the new unit by Engineering Manager William Price and his staff. Here are some of the 201-ft.-long dredge's most interesting features:

(1) To work the processing plant at or near capacity, there are variable-speed dc. drives on the digging ladder and other units to keep material flowing at the desired rate. A set of ammeters informs the operator of loads on processing units.

(2) This next feature is a "first" for media plant rinsing screens, Mr. Price believes. Occasionally, the media plant is not needed. Then the two media rinsing screens—two-deck units—are used as straight gravel washing screens. A second novel feature of the media rinse screens: Lengthwise dividers that separate sink and float are adjustable to match any long range variation in the proportions of sink and float.

(3) An all-crushed product can be made by the impact crusher and loaded out separately when required.

(4) As in many new plants, a great deal of flexibility is provided. Example: Both the crusher and scrubber can be by-passed. "Mouse-trap" units with movable chutes do this job.

Taking a tour through the floating plant, here's what you'll see: Once the deposit has been reached, the operator locates the angle at which he will dig. His four "spuds," or tall steel anchor posts, keep Dredge 16 in one spot. A long 1,800-ft. shore cable to each shore lets him swing the dredge at will.

Please turn page

DREDGE 16 loads four 500-ton barges at once. Twin "roughing" screens are seen on top, scrubber beneath, heavy media plant at the near end

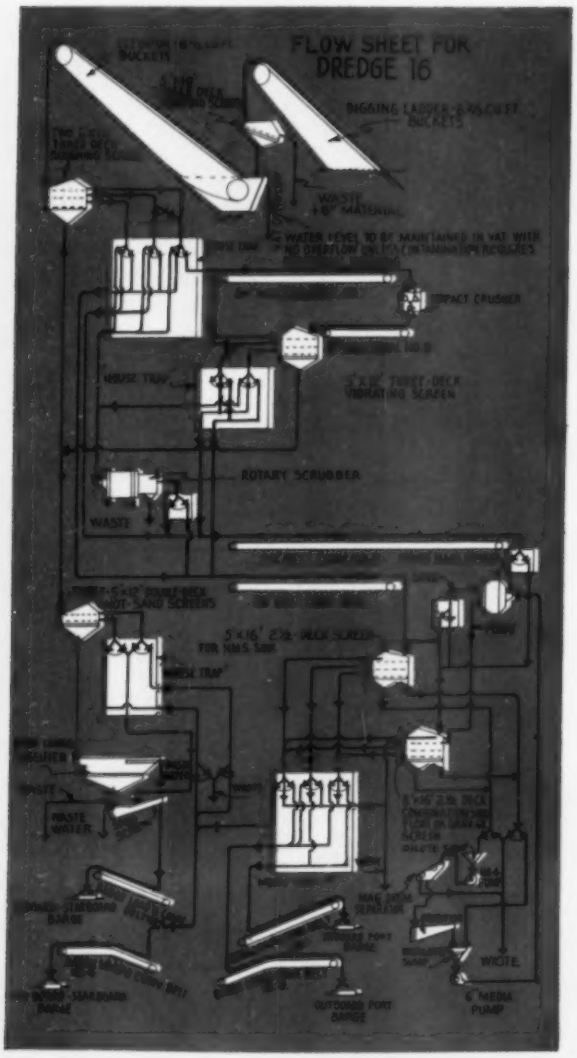
RIGHT: A digging ladder with 100 manganese-steel buckets dips into the river 50 ft. Variable-speed drive changes the ladder's speed so its output keeps up with capacity of the processing system

DRAVO'S NEW DREDGE WINS BRAVOES

continued from page 99

Using one of the spuds as a pivot, the operator works around in a short arc. The 100-ft. digging ladder is sure to remove all usable material down to its 50-ft. working depth. The long ladder has 100 cast manganese-steel buckets, holding 7 cu. ft.

Dropping off the discharge end of the digging ladder, incoming material hits a single-deck scalping screen. The small amount of plus 6-in. gravel, too large for Dredge 16's crusher, is scalped off and returned to the river. Throughs drop to the "vat," a big settling-tank-type container. It is used to remove slimes and floating trash when working very dirty deposits; clean water is added in these cases, and the dirty overflow is wasted.



Next, material in the vat is lifted to the top of the dredge by a bucket elevator. Used instead of a conveyor belt because it lifts at a steeper angle (permits a more compact plant), it is made of 60 buckets identical to the digging buckets.

Now the two "roughing" screens come into play. Visible atop the plant, they make the primary size separation. The twin, three-deck 5 x 12's typically make separations which (1) send plus 1½-in. to the impact crusher; (2) send 1½ x ⅜-in. gravel to the scrubber and then on to the media plant, and (3) send minus ⅜-in. fines to the three shot-and-sand screens.

At the 38-in. crusher, a crushed gravel screen is used. Located in closed circuit with the crusher, it permits recycling of oversize.

The media plant features a 10 x 10-ft. drum separator. It has all the needed accessory items for efficient operation: two rinsing screens, a magnetic separator and a densifier screw for recovering the valuable iron media.

Horizontal low-head screens wash and size shot and sand. Their low height is valuable in the dredge where low bridge clearances put height at a premium. (All but one of the dredge's nine screens are the horizontal type.) Grouped impressively side by side, the three washing and sizing screens for shot and sand are twin-deck 5 x 12's. Commonly making a separation at ⅛ in., they send throughs to the scalping tank and screws for final cleaning and classifying. Shot gravel, ⅜ x ⅛ in., goes directly to one of the four barges loading beside Dredge 16.

The scalping tank and dewatering screws remove slimes at two places; they also permit a size separation, if desired. Dravo anticipated the need for making both masons and concrete sand by fitting the scalping tank with eight discharge valves. These handy valves have a second valuable use—they can remove a "belly" in the size-gradation curve by precisely reducing the amount of the too-plentiful fraction.

Now all products have been processed. Gravel has been prepared by passing through one or more of these steps: crushing, scrubbing and beneficiating in the media plant. Sand fractions have been sized and cleaned on this equipment: washing-sizing screens, scalping tank and dewatering screw. Either a ⅜-in. or a ⅛-in. top size sand can be made.

Four of Dravo's own 500-ton barges are loaded

Please turn to page 102

GET REAL PRODUCTIVITY—GET A GM DIESEL

"We can work our 'Jimmy' powered John Deere 440 on loading jobs in place of bigger, more expensive loading equipment, cutting our operating cost yet maintaining production in our material-handling operation. When you can lick problems and save money at the same time, you know you have made a good investment."

That's Ypsilanti, Michigan, sand and gravel company owner Lamar Thumm talking about his company's GM Diesel-powered John Deere 440-I. And he has more to say.

"With plenty of power available from that 'Jimmy,' we get good acceleration and positive bucket control for faster job cycles. That tractor's got the power and reach to load anything up to a 10-yard tandem. We have trouble starting our other Diesels in cold weather, but that GM Diesel starts right off. Putting the John Deere with 'Jimmy' power to work has given us a real handy man on the job."

Lower capital investment and faster job cycles add up to real productivity and profits for Lamar Thumm Sand & Gravel Company. You'll get the same things if you put GM Diesel-powered equipment on your jobs. Want to know more? See your GM Diesel distributor—he's in the Yellow Pages under "Engines, Diesel"—or write direct.

GM DIESEL

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GM DIESEL ALL-PURPOSE POWER LINE sets the standard of Diesel productivity

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DRAVO'S NEW DREDGE WINS BRAVOES

continued from page 100

simultaneously, two on each side of the dredge, by four stockpiling belts jutting from its sides. Products in most demand are: 1½ x ⅜; ¾ x ⅜; ⅜ x ⅛ (shot gravel), and sand. Once each day one of Dravo's fleet of towboats comes alongside, taking away with it a tow of up to 15 loaded barges. The towboat then moves to Dravo's other dredge, an older 375-tph. unit also equipped with a HMS plant, and picks up more barges to complete the tow. A tow of 15 barges is preferred, since this makes a single lockage through the locks on the busy Ohio River—Dravo's "water highway."

Dredge 16 is proving to be the best possible answer to questions Dravo asked itself when considering the deficiencies of the former system. These were the questions: Should their 35-year-old operation be replaced by a new dredge, by a shore plant, or could the old dredge be modernized? The ideas of shore plant and modernizing were eliminated in this way:

—Modernizing would be costly. Actually, the 350-tph. capacity wasn't enough to keep pace with rising sales, nor enough to amortize quickly the cost of modernizing (smaller plants have lower unit profits). Too, revising the setup to include media plant and crusher would be complicated, calling for lengthening and repowering the dredge at excessive cost.

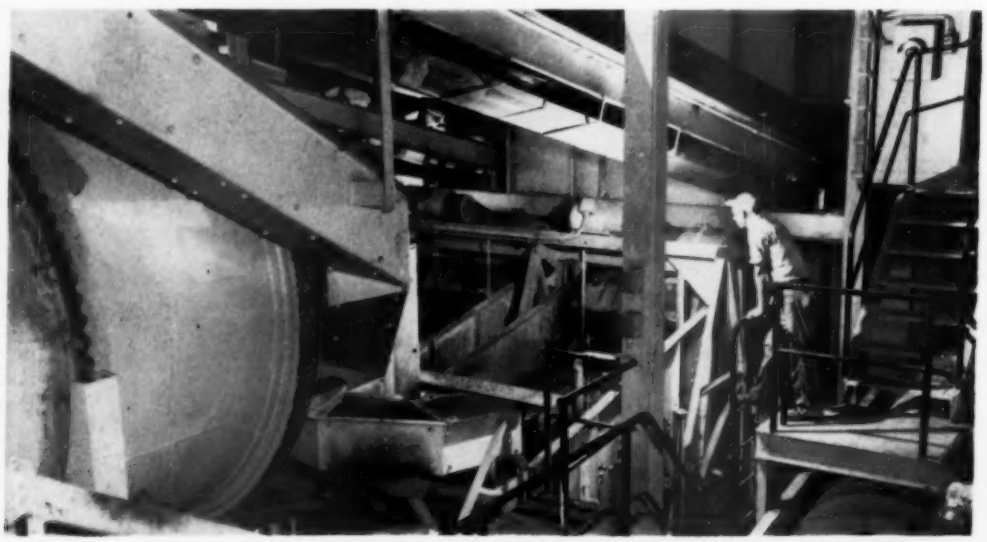
—A plant on shore would not be practical, either. First of all, Dravo's markets are spread out over a hundred-odd miles along Pittsburgh-area rivers. Land transportation (up to five times as costly as barge hauling) or an additional rehandling and hauling step would often be necessary, compared with the dredge. Sand and gravel are not always found in the same location. Huge stockpiles, wastepiles and tailing ponds would thus be necessary at a shore plant—a disadvantage in space-short Pittsburgh.

The new dredge cost a healthy $2 million. It was designed and detailed by Dravo's own engineers and built by its own shipbuilding division on Neville Island.

Completed just last July, Dredge 16 is proving a valuable addition to the firm's production setup. Recognizing its pacesetting design, producers from other cities are visiting Pittsburgh to see Dredge 16, reports F. J. Lloyd, vice president (Keystone Div.) in charge of the company's aggregates operation. **END**

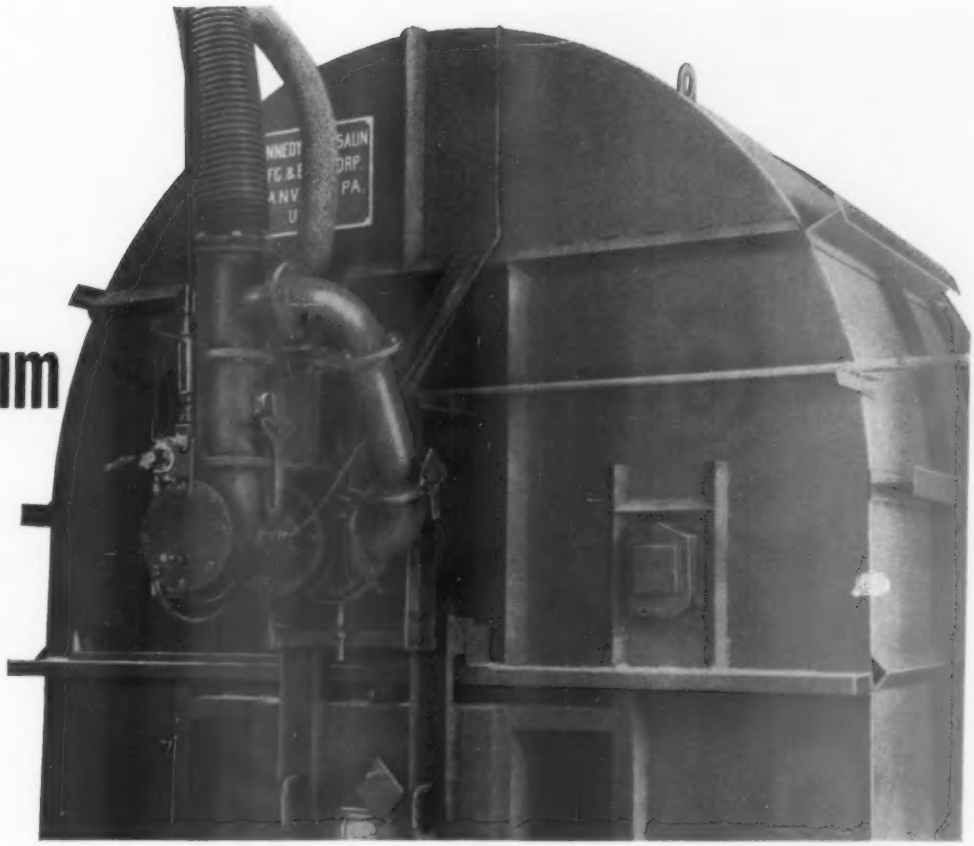
MAJOR EQUIPMENT REFERENCE

Design and fabrication	Dravo Corp.
Buckets for digging ladder, bucket elevator (7 cu. ft.)	Taylor-Wharton Co.
Screens (all low head): Scalping, 5 x 10-ft. (1) 1-deck; Roughing, 5 x 12-ft. (2) 3-deck; Crusher, 5 x 12-ft. (1) 3-deck; Shot and Sand, 5 x 12-ft. (3) 2-Deck; HMS, 5 x 16-ft. (2) 2½-deck	Allis-Chalmers Mfg. Co.
Crusher, CF-938 impactor	Pennsylvania Crusher Div.
Scrubber, 8 x 12-ft. rotary	Smith Engineering Works
Heavy Media plant (Mobil-Mill) Drum, 10 x 10-ft.; Densifier, 48-in.	Western Machinery Co.
Magnetic Separator, 30 x 60-in.	Dings Magnetic Separator Co.
Scalping tank, 4 x 12-ft.; Screw classifier-dewaterer, 54-in.	Eagle Iron Works
Conveying system	Hewitt-Robins Inc.



HMS PLANT'S separatory drum, densifier (lower right) and big rinsing screens are compactly arranged. The screens serve for sizing gravel, whether the heavy media plant is being used or not

for maximum fire power



KENNEDY KILN FIRING SYSTEMS

When seeking economies in rotary kiln operation, either through decreased fuel consumption or increased kiln capacity, look first to your firing system. These economies are dependent primarily upon a perfectly balanced and controlled fuel and primary air supply. This is inherent in all KENNEDY Kiln Firing Systems.

Whether your fuel be coal, gas or oil—or any combination of these—a KENNEDY Kiln Firing System will burn it most economically. This results in improved heat transfer and uniformity of kiln temperature.

A KENNEDY Kiln Firing System answers the need for "Maximum Firepower."

FOR PULVERIZED COAL—KENNEDY's Air Swept Grinding Mill, proven in many successful steam power plants, cement plants, and lime plants, supplies properly-sized coal particles to the burner, combined with exactly the right quantity of primary combustion air. Low maintenance, reliability, automatic feed control, quick response to changing loads and replacement of grinding media without shutdown, make this the ideal system for kiln or boiler firing service.

FOR GAS—The KENNEDY Gas Firing System is the only system which produces a luminous flame, of adjustable length, assuring maximum radiation of heat with maximum efficiency over a wide range of capacity.

FOR OIL—Fuel Oils of any grade yield maximum heat per fuel dollar when burned in a KENNEDY Kiln Firing System.

Take advantage of the added economy and performance which is characteristic of KENNEDY Kiln Firing Systems. Consult KENNEDY's engineers.

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WITH A SMILE OF SUCCESS, NLI President Robert M. Koch opens the festivities at the 15th annual meeting

CHAIRMAN-ELECT Arthur R. Alvis, (center) gets his gavel. President Thomas E. Lalley, (left) and Chairman W. L. Bryan make the presentation

NLI continues fight for conservation and roads

A FEDERAL agricultural conservation program that is big enough and good enough to help the farmer and conserve the land is a major goal of National Limestone Institute. Another target is continuation, with no slow down, of the federal road program. The limestone industry has a big stake in both.

Producers of limestone met to discuss these programs at the fifteenth annual meeting of NLI in Washington, D.C., January 19-21.

First off, though, they had a matter of their own business to take care of. They merged the National Agricultural Limestone Institute (NALI) and the National Crushed Limestone Institute (NCLI) into a new corporation and gave it a new name—National Limestone Institute, Inc. (NLI).

Although the merger was basically a change in name only, NLI now has three divisions: Agricultural Limestone Division (ALD), Crushed Limestone Division (CLD) and the Manufacturers' Division. Producer members of NLI are free to join either or both ALD and CLD. The policies and programs of the former two organizations have been carried through to the new one.

NLI's fight for conservation centers specifically around the federal Agricultural Conservation Program (ACP). Under that program, the government pays a portion of the cost of aglime purchased by farmers. Limestone producers, through the NLI, have plugged for an ACP appropriation of at least $250 million. There's been some diffi-

Please turn to page 106

How short 180° turns boost pit output

When you maneuver Tournapull® Rear-Dumps under a shovel dipper or into restricted dump areas, waste time is practically zero. LW's *exclusive*, electric, kingpin power-steer lets these machines make fast non-stop 180° turns in less than their own length . . . in *only about 70% of length with bowl raised!*

There's no need for turntables or elaborate turn-around areas. And on the haul, you make hair-pin turns with complete safety, and save time while doing so. Time saved adds up to extra trips per shift, greater production . . . with *no increase in man-power or equipment investment.*

Simplicity reduces maintenance

The simplicity of Tournapull's turn-mechanism also cuts your maintenance expense. Steering involves only an electric motor, connected to a rugged ring-gear kingpin shaft. To activate the steer-motor of a C 'Pull* or "D", your operator moves an electric switch. A quick push to left or right turns the machine in the desired direction until the steering button is released. On the B 'Pull the same result is achieved with a short movement of the steering wheel. Turns are made quickly, regardless of footing. There are no fast-wearing parts to develop "play" in the steering mechanism, no cumbersome hydraulic jacks or other mechanism to limit turning ability.

Exceptional maneuverability is only one reason why LW Rear-Dumps haul more tons per hour at lower cost. To understand the true value of Tournapull haulers, it will be worth your while to see them in action. Available in three sizes: 11, 22, and 35 tons, 143 to 360 hp. Ask for full details and demonstration.

Just as it saves time in spotting for a load, LW Rear-Dump positions fast to save unloading time at hopper or dump. Says president of eastern quarry "Our 2 D Rear-Dumps get around the pit quick . . . turn fast in tight places . . . dump in a hurry. They really outmaneuver the hauler we used to have!" Adds operator, "I especially like the electric controls . . . this 'D' has all other haulers beat!"

*Trademark DR-2203-MQJ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

NLI CONTINUES FIGHT FOR CONSERVATION AND ROADS

continued from page 104

(LEFT) George Enfield: "Your industry is the industry that makes the farmer a profit."

(RIGHT) Congressman Fred Schwengel: "The limestone industry has helped to hold the line on highway costs."

culty of keeping it there, especially for the past year or two. The President's program for fiscal 1961 recommended only $100 million for ACP. This is not enough, according to the National Limestone Institute and agronomists.

Speaking of farmers' requirements for agricultural limestone, George H. Enfield, extension agronomist for the U. S. Dept. of Agriculture, told conventioners that some believe 80 million tons annually are needed to get the conservation job done in 10 years. "But," he said, "we need much more, since we have to get the job done now." Mr. Enfield estimates that aglime is needed now at the rate of three tons per acre; "Your industry is the industry that makes the farmer a profit."

The Institute believes, according to President Robert M. Koch, that more good in conservation work can be done through ACP rather than through the Soil Bank. Yet, the President's recommended appropriation for the Conservation Reserve Program of the Soil Bank for fiscal 1961 is $500 million. That's five times the recommended ACP appropriation for the same year.

How does the Institute hope to get their recommended $500 million annual appropriation for ACP? NLI and producer members think they'll have to keep on pointing out to Congressmen that farmers won't do the liming job themselves, as administration officials think they should. They stress the point that ACP is a partnership, and that the return in value to the farmer is high for the money expended through that program. NLI has results of questionnaires sent to farmers and conservation people to back up these beliefs.

The federal highway program should not be the victim of a stretch-out, according to NLIers. Congress had trouble in raising money for the Highway Trust Fund this past year. The subject is still under discussion in this session. President Koch said NLI believes the ABC program should not be overlooked; that Congress should allow $1 billion a year to keep that program going. Yet, the President's message to Congress recommended that the program be cut back in fiscal 1962 and 1963 to $900 million. The CLD Board of NLI recommended continuation of a policy to secure a billion dollars a year for the program.

Congressman Fred Schwengel of Iowa has his own ideas about the federal highway program, and he passed them along to NLI conventioners. "In less than four years," he said, "because Congress was not realistic, because there were too many demands and because mistakes were made, the highway program was in trouble." The result is that latest estimates for the program show an $11½ billion added cost above '55 estimates.

The limestone industry, though, has helped to hold the line on highway costs, according to Congressman Schwengel. Through its efficiency in operation, the industry has brought bargain prices to highways. He considered that feat as an endorsement of private industry. "Average bids for 1959 ran 11.3 percent below engineering estimates," he said.

The problem of meeting the supply of materials for the road program will be with us for a long time. That's the belief of Ellis L. Armstrong, Commissioner of Public Roads, Dept. of Commerce. The total program will use 4½ billion tons of aggregates, he estimates. Consider that huge volume along with the fact that some dozen states already face shortages of certain types of aggregates, and the problem becomes pointed.

Mr. Armstrong agreed with Mr. Schwengel that the big problem now is that of financing. Results of studies now underway—a 4-year study will be available in 1961, and the AASHO test study will come along soon—will help to solve the problem.

If reports of scarcity of good material for building roads is true, some materials that have not been considered as usable may have to be used.

Please turn to page 110

FRAMED FOR LONG LIFE

...to give you top performance on haul road maintenance

A strong, stable blade-foundation is essential if a grader is to give you high output. That's why LeTourneau-Westinghouse Adams* graders are given rugged, solid-strength, one-piece frames... that take all of the shocks, twists, and stresses of hardest day-to-day operating conditions.

Continuous-welded... front to rear

Front-to-rear members of the L-W main-frame are heavy steel U-channels. Up front, two full-length channels are welded together to form a box section. Channels separate at top of arch and become two boxes by addition of two heavy steel plates. Frame is continuous-welded from front bolster plate to boxed-in rear-end.

One major advantage of this boxed-channel framing is that it provides *maximum strength without excessive weight.* Result: with the L-W grader, more weight and strength can be built into important components, such as the big 63" L-W circle... none bigger in the industry... where size and strength mean better performance.

Steady blade-mount

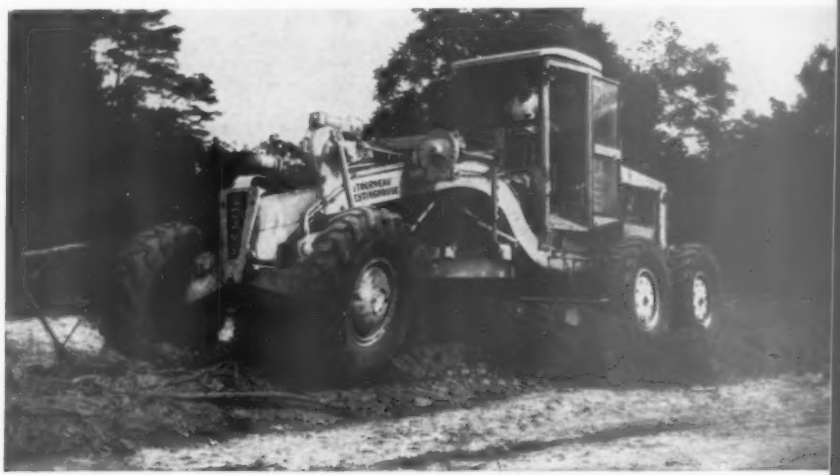
This unique L-W main-frame also provides a stable mount for the blade. No matter how tough the going, its solid strength assures a big bite... a smooth, precise finish-surface. No faltering when the blade hits heavy loads or hard-pan... no "riding-up", or deflection.

Operator has clear view of blade

With circle-lift controls mounted forward on frame, both ends of blade are clearly visible to operator, *whether he's sitting or standing.* Clear view of blade assures more accurate grading... and more work done each day.

6 models... 85 to 190 hp

Let us show you any of the 7 high-speed LeTourneau-Westinghouse graders in action. We'll prove to you how these machines can grade faster... more accurately... at less cost. Ask for details and demonstration.



Unique, box-type, L-W Adams one-piece frame runs from front to rear without sharp bends... without joints... without breaking points. Seventy-three years of grader experience have gone into the development of this frame. It's the foundation for L-W grader's rigid, smooth-cutting qualities that get more work done fast... at lowest cost.

*Trademark G-1955-MQ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

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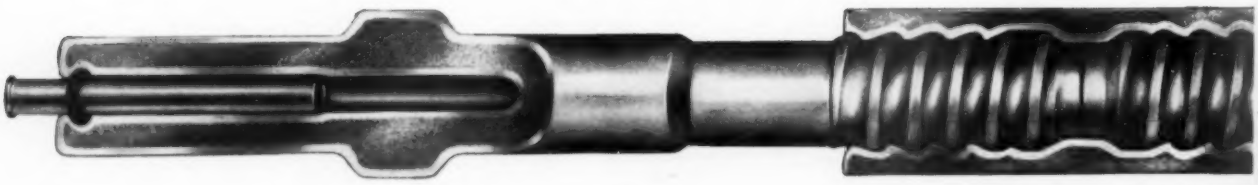
Where quality is a habit

You'll scrap all your old ideas about drill steel when



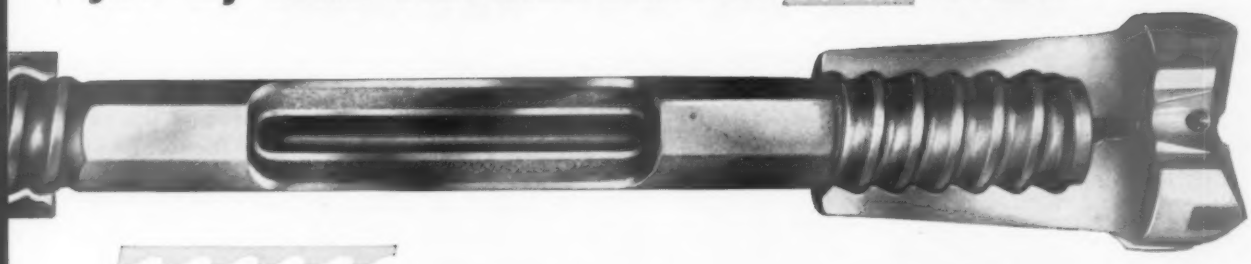
ONLY GARDNER-DENVER

gives you all these field-

ALWAYS UNCOUPLES BY HAND

New HI-LEED thread design makes wrenching unnecessary. Gardner-Denver engineers have incorporated field-proved reverse buttress design into an entirely new thread form that always uncouples by hand.

you try NEW GARDNER-DENVER *HI-LEED* STEEL



HI-LEED DRILL STEEL

proved advantages

CUTS DRILLING TIME ON EVERY HOLE

HI-LEED steel saves time in adding rod . . . and ease of uncoupling, without use of wrenches, helps drill hole faster.

SENDS MORE IMPACT TO THE BIT

HI-LEED sectional steel transmits drill impact almost as well as a solid rod. That's because precision-milled threads on rod and coupling are in close contact over a large total area, thus holding rod ends firmly together.

DRILLS MORE FOOTAGE PER ROD

HI-LEED rods are designed to last longer than any other sectional steel, and the wide thread peak assures maximum wear.

Design details are carefully engineered to eliminate much of the usual friction and stress concentrations. Carburizing and shot-peening give the steel a hard surface and tough inner core.

PREVENTS LOST HOLES

New HI-LEED design keeps mating parts snug—rods won't uncouple in the hole or while pulling out. Other thread forms may not hold a tight connection and many rod strings have been lost in the hole while pulling out with rotation on.

Drillers who have used this unique and revolutionary Gardner-Denver thread design are enthusiastic about its convenience and economy. Give it a try on your own rock drills—you'll soon see why. Call your Gardner-Denver drill steel specialist, or write for new bulletin on HI-LEED steel.

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NLI CONTINUES FIGHT FOR CONSERVATION AND ROADS

continued from page 106

D. O. Woolf, chief of the concrete section, Div. of Physical Research Bureau, Bureau of Public Roads, made the prediction. He listed as some defects of limestone used for road work: (1) undesirable materials contained in the stone, (2) effect of weather and (3) hydrophilic, or water loving, character of stones.

But some of these defects can be removed with proper use of preventive engineering. For instance, undesirable materials can be removed with beneficiating processes such as heavy media separation. Drying or the use of waterproofing "drugs" added to concrete will reduce the water absorption rate of stone. If shale is present in stone, let the crushed stone weather a while. After a time, the shale will disintegrate and separate from the stone. He suggested the introduction of an inert material like powdered limestone to prevent alkali-aggregate reaction.

Equipment manufacturers and suppliers are contributing to more economical stone operations. Two sessions of the convention were allotted to this group to bring usable information on new products designed for increasing operating efficiency. Judged on the basis of the question-and-answer periods following product presentations, these were the most active sessions of the convention.

(LEFT) Ellis L. Armstrong: "Problem of materials supply for the road program will be with us for a long time."

(RIGHT) John Sapienza, on percentage depletion: "Supreme Court will hand down a decision that will satisfy the Treasury (Cannelton case), or they'll be after Congress again."

A new concept in blasting materials has come with the development of water-compatible slurry explosives. Since ammonium nitrate-fuel oil mixtures have caused some difficulty in application to wet holes (fuel oil and water don't mix), other fuels in combination with AN were tested. As a result, D. O. Conn of du Pont said his company came up with a product they call Tobex, which is a mixture of AN, TNT and water. Testing showed that water in wet holes dissolves the AN and fills the voids, raising density of the AN from 0.85 to 1.4 or 1.5. Advantages listed for Tobex include: (1) heavy in density; (2) non-cap sensitive, thus safer; (3) contains no gelatin dynamite, and (4) packed in polyethylene bags for convenience.

The new product has been used in holes down to 4 in. in diameter. The company expects later to have something developed for use in 3-in. holes.

The materials handling phase of an operation offers the best opportunities for cost savings, as the operation grows. Realizing this, Hewitt-Robins, Inc. has begun a program of specializing in standard, off-the-shelf sectional conveyors. The idea is to save the buyer money by getting the cost down, since sectional conveyors are produced in quantity. As to size, the company is jumping off in its program with drives up to 100 hp.

Many advantages are given for the standard sectional conveyors: (1) save money; (2) save time, since you can get units quickly; (3) dependable quality, because units have been tested fully; (4) versatility through ease in moving, changing length or speed; (5) fast erection.

Good sizing of products is important in the industry, particularly since specifications are getting stiffer. According to Robert Warner of Hoyt Wire Cloth Co., good sizing is dependent on many factors, and all of them should be considered. He listed as some of these factors: (1) relative position of undersize to oversize in a bed, (2) screening efficiency, (3) depth of bed, (4) distribution of feed across the deck, (5) operating conditions of the vibrating screen, (6) slope and (7) direction of vibration.

A sales panel, chairmanned by George A. Zeigler of the M. J. Grove Lime Co., was productive of many ideas for use to increase sales. A most important factor in sales success is personnel. Fred Montsdeoca of Domomite Products in Florida placed it first on the list. He also puts much faith in the area of coverage allotted to each salesman;

Please turn to page 136

Birth Of A Blast

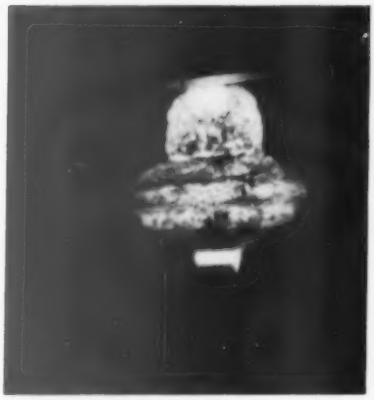
Many unique tools are used by Spencer Chemical Company in blasting research. For example, these exclusive photos, taken at intervals of seven millionths of a second by a special camera, record the detonation of a 4-lb. mixture of Spencer N-IV Ammonium Nitrate and fuel oil.

Research like this, conducted by Spencer's own staff, and sponsored by Spencer at leading U. S. research centers, results in new and better ways to use Spencer N-IV and fuel oil for blasting.

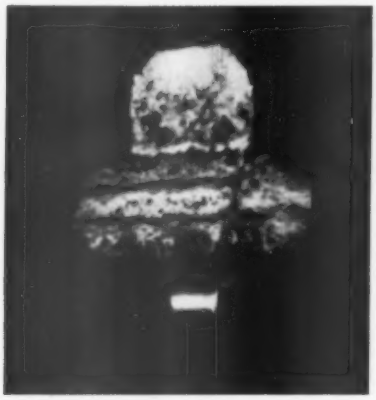
Spencer Chemical Company would like to share this knowledge with you. For information, use the coupon below.

2:13 P.M. The 13"-long charge, containing 94% Spencer N-IV Ammonium Nitrate and 6% fuel oil is about to be detonated.

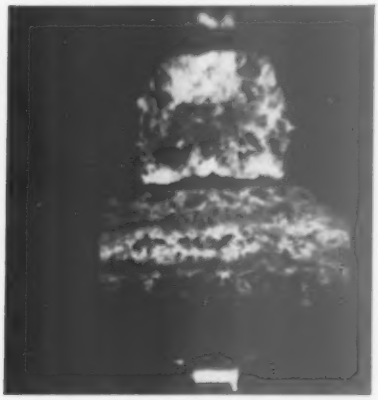
2:13.000028 P.M. The detonation wave has already spread over nearly one-third of the Spencer N-IV—fuel oil mixture.



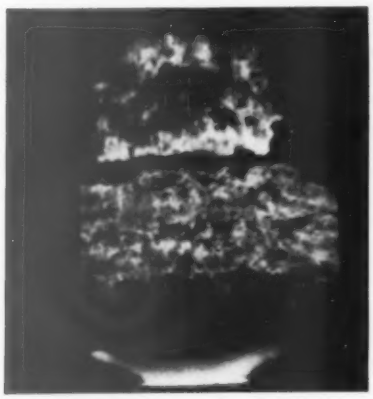
2:13.000056 P.M. This mighty, but controllable, energy is partly a result of N-IV's special structure and greater nitrogen content.



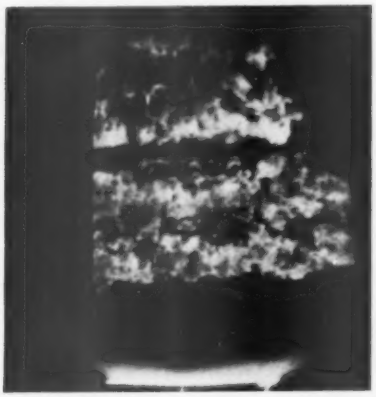
2:13.000088 P.M. Shown here is the great detonation velocity of the N-IV—fuel oil mixture. Yet, N-IV is safe to store and handle.



2:13.000128 P.M. The continuous and even release of energy shown here is a result of extensive Spencer research.



2:13.000160 P.M. Near maximum energy is now being released by the low-cost Spencer N-IV Ammonium Nitrate—fuel oil mixture.



2:13.000184 P.M. Full detonation! For information on how you can use Spencer N-IV Ammonium Nitrate, fill out, mail coupon at right.

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- ☐ Spencer Powder Monkey.

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When faced with rising demand for crushed stone that overtaxed his company's production setup. Jack Patterson reasoned:

One new plant is good, two are better

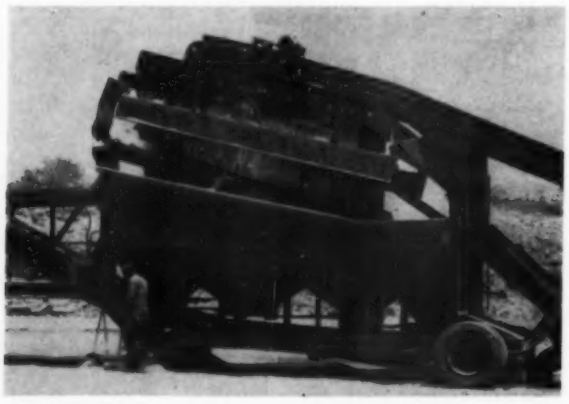
by Jack Patterson*

IT HAS BEEN MY DESIRE ever since I entered the crushed stone industry to achieve full weekly production through continuous operation, with no midweek maintenance nor overtime labor. The constantly increasing demand for stone in the Rochester, Minn., area, and the consequent need for running our equipment at capacity and beyond, presented me with a new challenge. In our family-owned enterprise, Patterson Quarries, Inc., I have had the chance to satisfy that ambition.

Within a two-year period, we added two portable crushing plants that doubled our production, shortened our work week, leveled our peak periods and extended our markets over four counties in Minnesota. Home base for our business is St. Charles, east of Rochester. The two new plants are at quarries at Eyota and north of Rochester. Combined production at our three plants now is 260,000 cu. yd. of crushed stone and 75,000 tons of aglime.

*President, Patterson Quarries, Inc., St. Charles, Minn.

THIS THREE-DECK, INCLINED SCREEN at Patterson's Rochester quarry has feature designed by the author: heavy beam supports for the screen (upper left) can be loosened to drop the entire screen into the bin for highway transportation



Both the Eyota and Rochester plants feature an impact crusher and wobbler feeder. The most noticeable difference in the two is that our newer one, at Eyota, employs a portable secondary hammermill and screen with the crusher; the Rochester installation is in closed circuit with a portable screening unit. Before going into production with the new equipment at Eyota, the Rochester plant was running a 60-hr. week. This has now been trimmed to 40 hr.

Our St. Charles plant still uses our older equipment which is now also portable.

Business has boomed since the end of World War II for Patterson Quarries, founded in 1938. I returned from service in December, 1945, after spending 33 months overseas. At that time we were operating one stationary crushing unit, the business being carried on by my mother upon my father's death in 1941. Expansion first got under way in 1950 with the purchase of a portable secondary unit and making our primary plant portable. Another milestone was reached at Rochester seven years later, with the installation of our first new portable plant. Then last year we took another step forward with installation of a portable plant at Eyota.

We're very gratified by the way our two new plants function. Both are run 40 hours a week, requiring eleven men at Rochester and eight at Eyota. Producing about 190 tons per hour, the Rochester operation produces road and street base materials and aglime.

WORKMAN observes material coming from Patterson Quarries' portable crushing plant, installed last year at Eyota, Minn.

When our Rochester plant is producing ¼ to ¾-in. rock, about 22 percent is aglime and 78 percent is specification-range stone. There is another advantage provided by our new machinery: previously, only about half our production was in specification-range size.

Our Eyota plant primarily produces ¾-in. base material for counties and state, and aglime. We can average 250 tph. with dry material and 200 with wet—which is often, due to the abundant heavy summer rains in this part of Minnesota. Wet ma-

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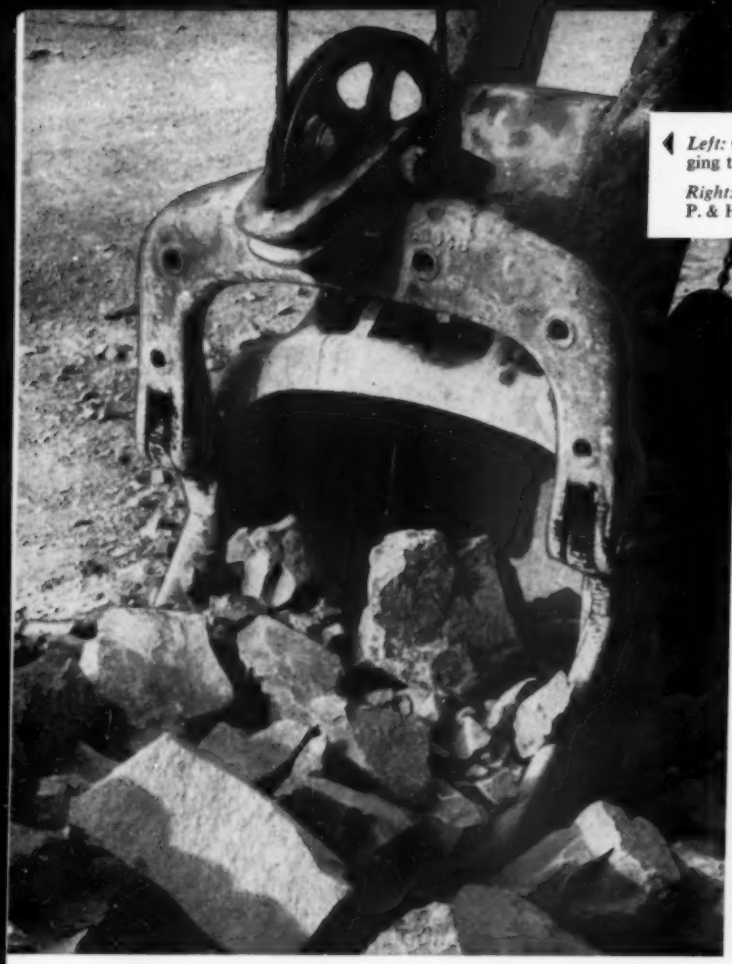
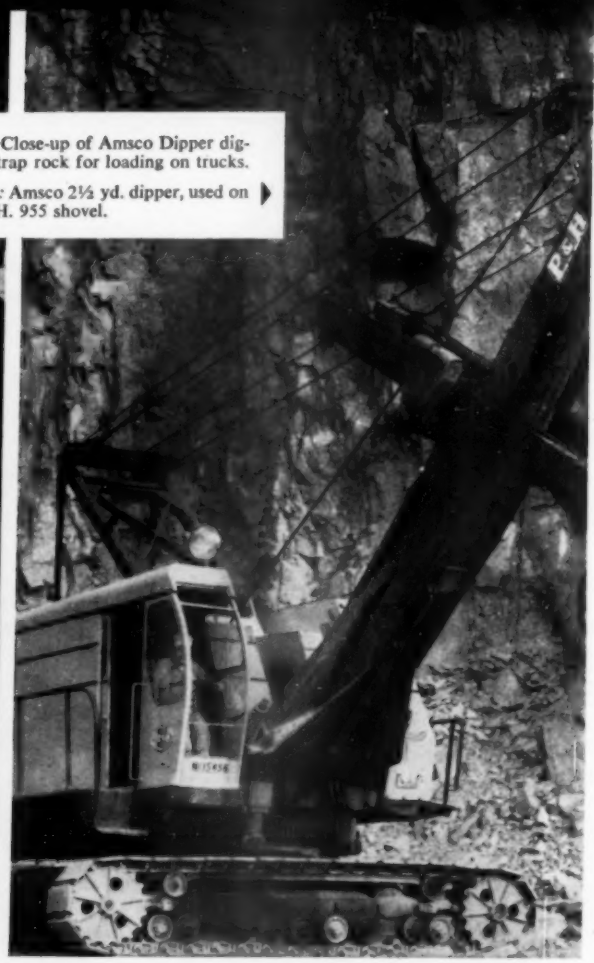


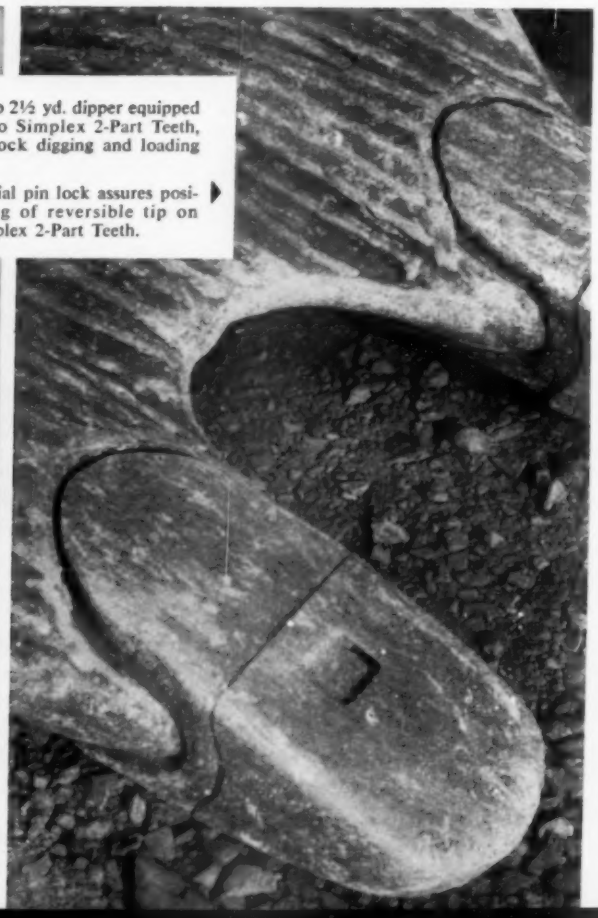
Left: Close-up of Amsco Dipper digging trap rock for loading on trucks.

Right: Amsco 2½ yd. dipper, used on P. & H. 955 shovel.



Left: Amsco 2½ yd. dipper equipped with Amsco Simplex 2-Part Teeth, used for rock digging and loading at quarry.

Right: Special pin lock assures positive locking of reversible tip on Amsco Simplex 2-Part Teeth.



More proof that...

AMSCO HELPS YOU MOVE MORE TONS PER DOLLAR

Read about the actual experience of a large New England quarry with Amsco Dippers and Simplex 2-Part Teeth*

"WE HAVEN'T WORN OUT AN AMSCO DIPPER IN 5 YEARS"

This, in the words of the quarry superintendent, sums up his experience with Amsco Manganese Steel Dippers. It's rugged work, all in rock, as you see from the pictures at the left. Shovel and dipper are used to load trap rock onto trucks for transportation to the crushing plant.

The Amsco Dipper was installed because the superintendent had used them before, and knew their reputation for long life under tough digging conditions. Experience is proving him right . . . again.

SIMPLEX TEETH HANDLE 25,000 YDS. OF ROCK BEFORE REPLACEMENT

At this same quarry, Amsco Simplex 2-Part Teeth are giving 120 hours' service... handling 25,000 to 30,000 yards of rock... before replacement is necessary. That's considerably longer service than has been obtained from competitive 2-part teeth, the quarry superintendent states.

Not only is the wear-life of these teeth exceptional, but operators like the ease of replacement, and the fact that the tips stay on without trouble.

For further information on Amsco Dippers or Simplex 2-Part Teeth, see your power shovel equipment dealer, or write to Amsco for technical bulletins showing sizes, types and application data. *Patent No. 2,904,908

AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

Other plants in: Denver • Los Angeles • New Castle, Dela. • Oakland, California • St. Louis
In Canada: Joliette Steel and Manitoba Steel Foundry Divisions

THE ROCHESTER QUARRY is the site of efficient drilling and shovel loading operations. Slabs of shot rock in the foreground lie to the left of a short-haul road that leads to the portable plant

THE AUTHOR, Jack Patterson, at his desk

FROM ONE TRUCK to another, shot rock travels a short route via wobbler feeder, impact crusher and inclined feeder

ONE NEW PLANT IS GOOD, TWO ARE BETTER

continued from page 113

terial doesn't inhibit the primary crusher from full production. On the contrary, the slow-down is caused by the by-passed wet fines that go directly to the secondary crusher and create some difficulty for the screen.

Quarried material at both Rochester and Eyota is Plattville limestone, a hard but nonabrasive stone that sometimes contains as much as 92 percent calcium carbonate. However, quarrying technique differs, due to the amount of overburden. At Rochester, it is 30-40 ft.; at Eyota, 4-5 ft.

Here is a brief rundown of the operation at the two new plants: Scrapers with pushers and pullers remove the overburden at Rochester, exposing a 21-ft. deposit of rock.

Three-in. diam. holes are drilled 8 ft. apart in five rows, with the first row very close to the face. First, we place three sticks of dynamite in the bottom, then fill the holes to about 18 in. from the top with ammonium nitrate. We use 250 lb. of dynamite, 42 sacks of AN, blasting once a week.

At the 35-ft. deep Eyota deposit, we drill 4½-in. diam. holes to the full depth; they are in five rows, 9 ft. apart. Capping the holes at the bottom, we load them with 15 lb. of dynamite, then alternate with 25 lb. of nitrate, another stick of dynamite, and so on until the hole is filled, finishing with a stick of dynamite on top. We blast about once a week, and get a yield of from 1½ to 2 cu. yd. of rock per pound of explosive used. Percentage of dynamite to ammonium nitrate is 20 to 80.

There are slight variations in the processing techniques at the two plants, too. First, at Rochester, shot rock is loaded into dump trucks by a 1-cu. yd. shovel for the trip to the crushing and screening plant. Openings of 2½ in. between the elliptical bars of the wobbler feeder take out the bulk of material this size and smaller, and pass it directly via conveyor belt to the portable screen. Material not passing the top deck of the screen is reconveyed through the crushing process.

This screen, by the way, has a design feature that I suggested for ease in transport. The 5 x 12-ft., three-deck, inclined unit can be lowered into the bin beneath it, to allow clearance under bridges and viaducts when it must be moved on the highway. This is done by loosening the heavy beam supports that hold the screen above the bin.

Screenings are removed by trucks to stockpiles or to a washing plant nearby. The closed-circuit crushing and screening plant produces aglime as well as chips.

Processing of rock at Eyota follows a similar pattern. Two 15-ton trucks take it from quarry to crusher. Here, too, a wobbler feeder keeps material 2½ in. and under out of the primary crusher. By-passing the primary stone goes by conveyor to the hammermill secondary. The later is fitted with a 4 x 12-ft., three-deck screen.

At these plants, hammer maintenance has been low. We have noticed this particularly at Rochester, where the long work week formerly required welding maintenance on the hammers every week. Contrast this with the hammer touch-up that now needs to be done only once in two weeks. No maintenance of any kind has been necessary on either wobbler feeder. This is a great invention. The ability of this feeder to take out the bulk of the fines, wet or dry, and keep them out of the primary crusher is worth at least $100 a day to me.

END

HANDSOME BUILDING is headquarters for Patterson Quarries

MAJOR EQUIPMENT REFERENCE

ROCHESTER, MINN.	
Impact Master, 3645	Universal Engineering Corp.
Wobbler feeder, 2½-in. openings	
Screen, 5 x 12-ft., 3-deck, inclined	
Wagon drill, 3-in. diam.	Gardner-Denver Co.
Compressor	Chicago Pneumatic Tool Co.
Shovel, 1 cu. yd.	Link-Belt Speeder Corp.
Dumpsters, W60, (2)	Koehring Co.
Motor Scrapers, S12, (2)	Euclid Div., GMC
Tractor, HD20	Allis-Chalmers Mfg. Co.
Scrapers, LP, (2)	Caterpillar Tractor Co.
Tractors, D8, (3)	
Screw washer with spray bar	Eagle Iron Works
Screens	Iowa Mfg. Co.
EYOTA, MINN.	
Primary Crusher, 3645, impact master	Universal Engineering Corp.
Wobbler feeder, 2½-in. openings	
Secondary crusher, hammermill	Iowa Mfg. Co.
Screen, 4 x 12-ft., 3-deck, horiz.	
Rotary drill, 4½-in. diam.	Schramm, Inc.
Trucks, 15-ton, (2)	Euclid Div., GMC
Shovel, 1¼ cu. yd.	Link-Belt Speeder Corp.

Their aim: *to double production without increasing overall loading costs.*
Solution: *this 4½ yd Michigan Tractor Shovel. Its regular time-record:*

60 SECONDS TO LOAD

At the Oneglia & Gervasini pit near Woodbury, Connecticut, they are loading trucks in *half the time* it ever took before!

Overall loading *costs*, nevertheless, have stayed practically the same!

Reason for this production-doubling, cost-cutting record is the 4½ yard Model 275A Michigan Tractor Shovel shown on these pages. This unit has *1½ times the bucket capacity* of the most commonly-used size of mobile Tractor Shovel. Its speed of loading has been remarkable . . .

Heaps small trucks in 20 seconds, 20 yard semi-trailers in 2 minutes

Working mostly with 10 yard, 10 wheel trucks in this 1,000-ton-per-day traprock quarry, the Model 275A has established an average load cycle of only 60 to 70 seconds *—from first pass into a stockpile 'til loaded truck pulls away.* "On our busy days," reports Supt Theodore Tietz, "we move 10-yard trucks out of our pit at the rate of one per minute." Smaller trucks generally require only 20 to 30 seconds (one pass) to load. Twenty to 24 yard semi-trailers usually take 2 to 2½ minutes (four or five passes). These records cover two years of operation and all grades of crushed stone, all kinds of weather. In one typical time-and-motion study, for example, the Model 275A regularly dug into a half-frozen stockpile of 1½ inch stone and backed off with a heaping 4½ yard payload *in only 7 seconds!*

Carries 5 ton load up 35° slope

High-speed loading like this has been *only one* of Michigan's important achievements. The 262 hp rig has taken over some tough stockpiling chores too. Like moving two-inch stone to the top of a 100 ft high stockpile. The last 60 feet of ramp to piletop here is pitched *at a 35-degree angle*—yet the Michigan regularly carries a heaping *5 ton load* up it. Back-dragging on the return trip accurately spreads and compacts a 4 to 5 inch layer of gravel to keep the ramp graded for continuous dumping.

"I particularly like Michigan's bucket action. Even in frozen stone, you can push in and get a full load without straining"—Operator Bob Faccin.

SPECIFICATIONS		
	Model 275A	Model 375A
Bucket capacity (standard SAE ratings)	4½ yards	6 yards
Lifting capacity	22,000 lbs	30,000 lbs
Weight	46,000 lbs	61,000 lbs
Speeds (forward and reverse)	0-28 mph	0-25 mph

Seven other standard Michigan Tractor Shovel models, 16 cubic feet to 2¼ cubic yards (SAE bucket ratings), are available.

"This big Michigan effectively dresses stone stockpiles. Its 10'8" wide bucket makes it an excellent snow plow. It even does well on such tough dozer jobs as shovel cleanup and stripping quarry top prior to drilling"—Supt Theodore Tietz.

EACH 10 YARD TRUCK

Moves 11 ton boulders

Michigan handles "super-lifting" assignments too that smaller Tractor Shovels couldn't touch. Rip-rap, for example. Some of the traprock boulders uncovered in the Oneglia-Gervasini pit weigh 10 or 11 tons! The Michigan makes short work of stockpiling or loading them into trucks. "In fact," says Supt Tietz, "the Michigan frequently in the past 2 years has moved rocks our quarry shovel couldn't handle!"

Model 275A easy to maintain

One reason O & G's Michigan performs so well on all these tough jobs is its all-Clark power train . . . Clark torque converter, power-shift transmission and planetary wheel drive axles . . . all matched to each other . . . all designed to the same general specifications as the Clark components which have proved so efficient in the 15,000 smaller Michigan Tractor Shovels sold since their introduction in 1954. Also, some credit for Michigan's good performance here should be given the simple, systematic maintenance procedure followed. About half an hour a day takes care of lubrication as well as oil, water and torque converter oil check. Once a week engine oil and air filters are changed. "It's an easy machine to service," says Operator Bob Faccin, "and we feel the time is well spent."

If you load trucks, we honestly believe *your* time will be well spent on a study of the big Michigans. Both the 4½ yard Model 275A, described here, and the bigger 6 yard Model 375A are now proved by over two years in the field. Both are in regular production and readily available. See your local Michigan Distributor for details on performance . . . price . . . and delivery!

CLARK EQUIPMENT

Michigan is a registered trade-mark of
CLARK EQUIPMENT COMPANY
Construction Machinery Division
2481 Pipestone Road
Benton Harbor 27, Michigan
In Canada: Canadian Clark, Ltd.
St. Thomas, Ontario

At pug mill, Michigan Dozer moves 550 tons hourly up to 150 feet.

Major Southern quarry chooses Michigan Tractor Dozer for top-production job

375 hp model feeds 550 tons hourly to pug mill

Same unit also handles shovel and blast cleanup in pit ½ mile from mill.

At its top rate, this Michigan Tractor Dozer moves 550 tons of crushed stone an hour!

Pushes, one-way, range up to 150 feet.

Same unit also cleans spillage around two rock shovels located ½ mile away.

It alone does the work of two 50,000 lb class crawler dozers.

Owner: Lambert Brothers Division of Vulcan Materials

The Dozer is a 375 hp, 74,000 lb Model 380 Michigan. It is owned by Lambert Brothers Division of Vulcan Materials Inc, Birmingham, Alabama, one of the nation's largest stone pro-

New Michigan Tractor Shovel, latest of 15 owned by Lambert, truck-loads 3,500 tons daily

One of Lambert Bros 15 Michigan Tractor Shovels. This unit, a new Model 175A with 3¼ yd bucket, handles all truck-loading, also dresses stockpiles in Lambert's Nashville quarry. It loads 200 to 250 trucks, 3,000 to 3,500 tons per 8-hour day. Each pass—2700 lb/yd 3″ stone down to —100 filler dust—averages 4 tons, each load cycle takes 20 to 30 seconds. Unit works out of 25 stockpiles, scattered over 100 acres. Furthest run is ¾ mile—easy for the Model 175A's fast rubber-tired speed of 27 mph.

ducers. The Lambert Division alone operates 25 quarries in Tennessee, North Carolina, Kentucky, and Virginia; they are using this Dozer in their 80 acre pit near Nashville.

The story starts last summer. Harold and Glen Lambert had just installed the pug mill and needed something to feed it. Their existing crawler dozer wouldn't do; it obviously didn't have the mobility to do both pit cleanup and mill feeding. Another big *crawler* would be needed, it seemed. Then Nashville distributor McCarthy, Jones & Woodard suggested a rubber-tired Michigan Tractor Dozer. One was tried. The problem was solved. From four available sizes, a 375 hp model was chosen as best suited to the need (the other size Michigan Dozers: 162, 262, and 600 hp).

Main jobs: feed mill, clean around shovels

The 375 hp machine has been busy ever since.

Most of the time it works at the pug mill—dozing out into a stockpile from the feeder belt when the mill isn't running—feeding when the mill is running at a higher rate than available plant production (half or more of the crushed rock is fed into trucks and hauled to regular stockpiles).

Four to eight times a day, the 25 mph Michigan leaves the mill and drives down blacktopped roads to the quarry for shovel cleanup. Unit makes the ½ mile trip, which took crawlers 20 minutes or so one-way, in 2 to 3 minutes.

50% cut in shovel cleanup time

In the pit, the Michigan saves more time (and money). Back in Lambert Brothers crawler days, a good operator could clean the spillage around one shovel in 5 or 6 minutes. Today, their high-speed Michigan does each cleanup in 2 to 3 minutes.

50% cut in blast cleanup time

Another example of time saved is in blast cleanup. Once or twice a week, Lambert's crew shoots the 90 ft high quarry face. Each blast breaks about 22,000 tons of limestone, throws some rock as far as 600 ft. Used to take a crawler 45 minutes to an hour of full-time work to police the area. Now, the Michigan Tractor Dozer cleans up in 20 to 30 minutes.

Sound worthwhile for *your* job? Why not check first-hand? Drop us a line—or call—we'll show you a Michigan Tractor Dozer in action so you can judge for yourself.

Travel speed, job to job over pavement, reaches speeds of 25 mph.

Michigan is a registered trademark of
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An eminent authority evaluates the giant strides the U. S. has taken in the lime technology in the last few decades

From primitive to modern in fifty years

by Victor J. Azbe*

The lime industry has emerged from its "Dark Ages" just in my lifetime. So much progress has been charted in the last 50 years in its transition from primitive to modern! This progress holds promise of further great development, particularly in those many areas of the world still clinging to ancient production techniques. Lime, one of the cheapest of the basic chemicals which serve our many purposes, could be instrumental in helping us avert "Stark Ages" we hear so much about.

There is a tremendous need—possibly a four-fold one—for an increase in productivity in most lines of human endeavor. Growing populations and higher living standards impose great demands on our industrial and agricultural capacities.

The need is greatest in countries where productive facilities are lagging. Dr. M. S. Patel has said, "We in India wanted a chemical industry; then we found we had no lime so we could not have a chemical industry." Lime is produced in India crudely, inefficiently, in limited quantities and at high cost. This was also the case in the United States, but there was an awakening. Just during the present century we have had an accelerating spurt of progress of very satisfying proportions.

Here is a series of three articles reviewing what we have done in the lime industry, what we now have and how we attained it. I also may point to some future possibilities. In this way I hope to provide information and inspiration to my countrymen but, more than that, to assist others in many regions of the world whose production practices are still ancient.

In these first articles, I will trace the development in the United States of gas-fired kilns which are now taking hold the world over. Coming articles will be devoted to other types of kilns, as well as kilns of Germany, England, Sweden and other countries.

I apologize for the necessity of mentioning my own work frequently, but in many ways the history of the lime industry is my history. I was called into the lime industry 40 years ago as a consulting engineer on the basis of my work in the field of combustion. Since then, specializing in lime production, I have served several hundred lime plants in many countries on all continents. What I have done is not entirely my own; over the years I have had able assistants and associates, lime friends and others who helped and encouraged me on the long road.

Victor J. Azbe

ALL LIME KILNS ARE GAS-FIRED regardless of their fuel—coal, wood, fuel oil; even the coke of a mixed-feed kiln is partly converted to carbon monoxide and, thus, is gas-fired.

By producer gas-firing procedure, solid fuel is charged to a separate gas producer. A combustible gas is passed through gas flues into the kiln. However, producer gas may be made in the cavities of specially designed kilns, as in the case of fuel oil gasification.

The earliest type of lime kiln, as shown in Fig. 1, was thousands of years in development. It is not merely a heap of stone but a carefully engineered structure. The stone arch forming the firing chamber is a work of purposeful art, and the placing of the large stones in relation to the small ones throughout the kiln had its basis in generations of experience. A form of chimney of larger stone leads to the top of the charge. It is a kiln, at the apex of its development, indicated by its great size and its side contours. The sheet iron ring "A" serving as a windbreak, and for the purpose of increasing the draft, was probably the last effort at its improvement, one of those many steps which

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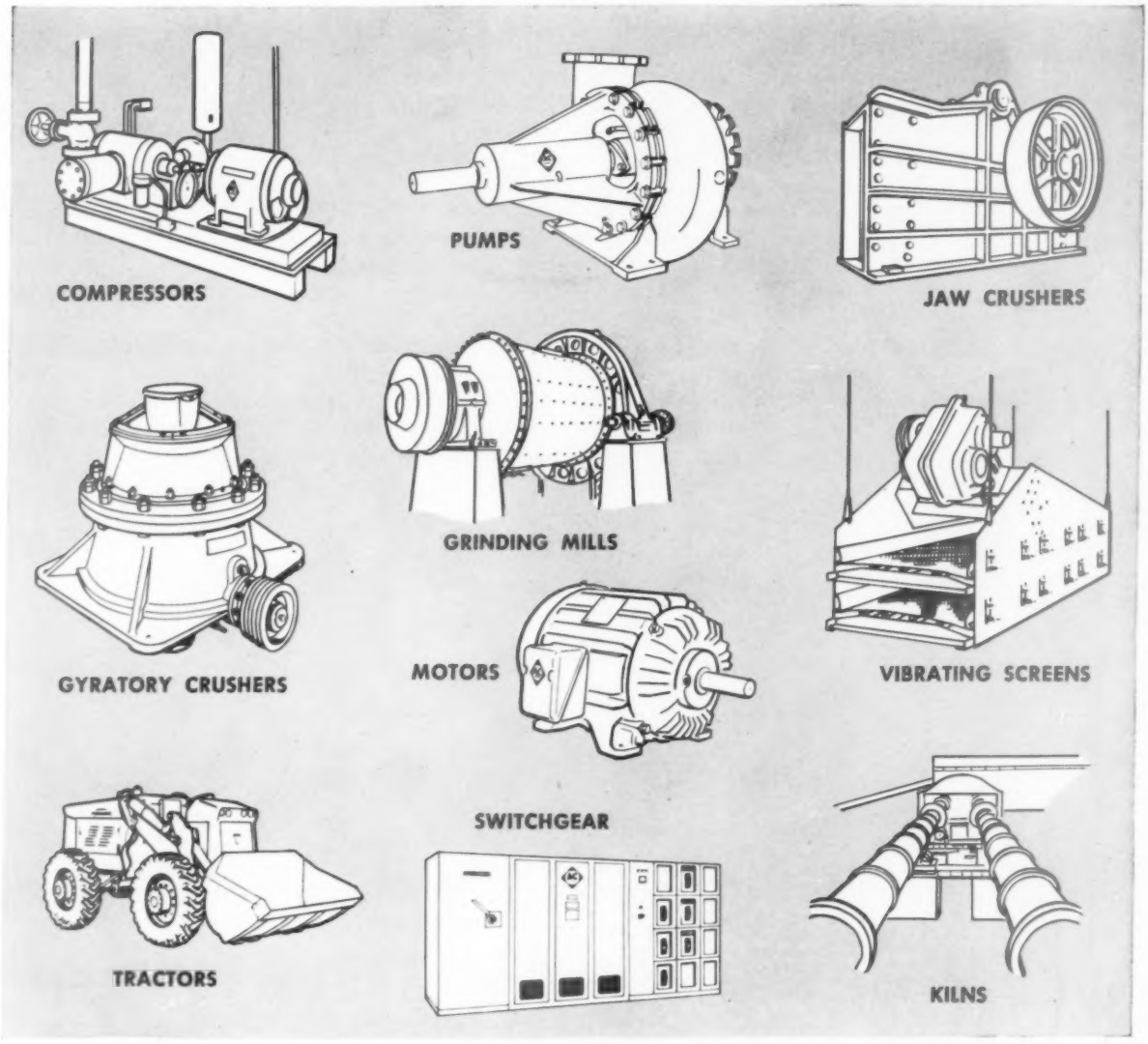
*President, Azbe Corp., Clayton 5, Mo.

ALLIS-CHALMERS



From pit to storage...

boost plant efficiencies...modernize with Allis-Chalmers full-process package

A-C engineers are uniquely capable of analyzing your entire operation and suggesting methods for improving your plant efficiencies. Fuel consumption, power demands, maintenance — all big profit eaters — are apparent to their cost-cutting eyes. And they don't make "guesstimates" — years of experience in the rock products industries furnish them with a background for accurate appraisal. New and unusual problems are referred immediately for test in Allis-Chalmers laboratories and pilot test plant facilities. A-1239

In addition to the equipment shown above, Allis-Chalmers offers a complete line of processing equipment, related electrical distribution, driver and control equipment, pumps and valves for all fluid-flow problems.

Contact your Allis-Chalmers representative or write ***Allis-Chalmers,*** *Industrial Equipment Division, Milwaukee 1, Wisconsin.*

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FROM PRIMITIVE TO MODERN IN FIFTY YEARS

continued from page 122

have been advancing the art of lime making lines through the ages.

These are called intermittent kilns because the operations follow each other in sequence. First, there is the charging of the stone, Fig. 2, the building of the firing chamber dome and the forming of the firing inlet. The large stone is placed ever so carefully, assuring that it burn to lime yet avoiding collapse of the structure. This operation is followed by several days of firing and one day of cooling. While the heavy walls are still hot, the kiln is emptied of the hot lime.

Stone charging, firing and lime drawing are separate operations, with the firing taking place during less than a quarter of the total time. This calls for larger and larger kilns, producing but a few tons of lime for an average day of the total time cycle. With continuous fired kilns, by contrast, all operations can be done simultaneously, and the firing is continuous the year around.

Except for an occasional farmer making a small amount of lime for his own use, such kilns have not been used in the U. S. within memory. But there are still thousands throughout the world today! One of our obligations is to offer these less developed regions a good, simple and cheap manner of lime production as a substitute for their intermittent kilns. It is an obligation that should be taken seriously.

The Israeli kiln would produce 85 tons for an operating cycle of 12 days or 7 tons per average day. Stone charging required 3 days of 5 men; firing period was 4 days, cooling 1 day and emptying 4 days. Total labor was 57.5 man-days on the kiln.

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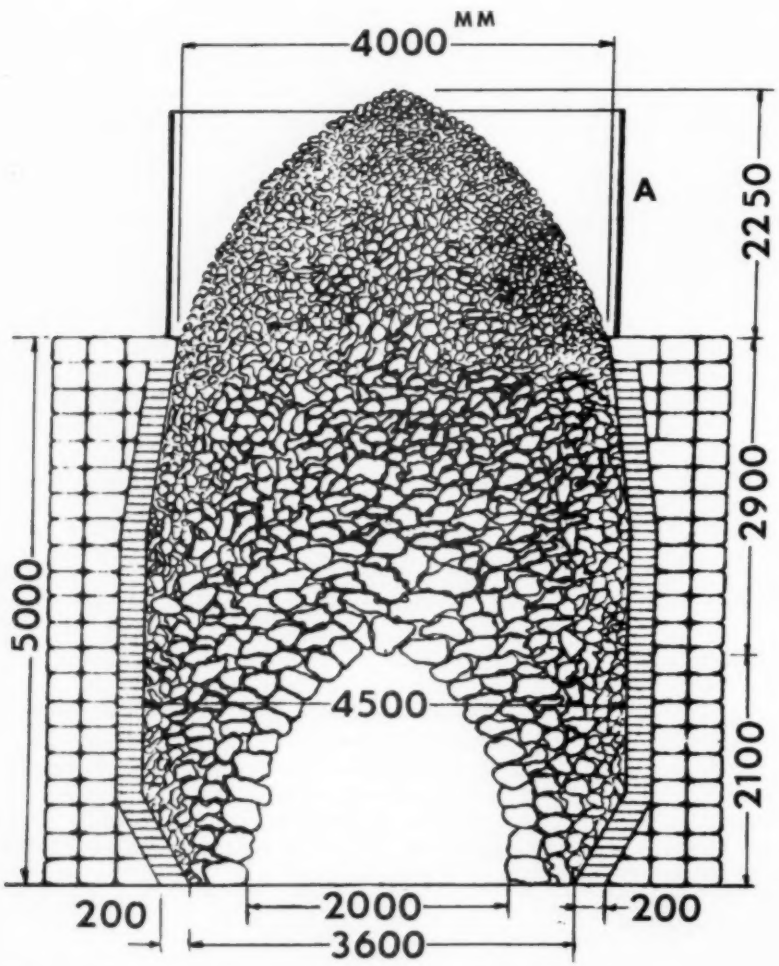
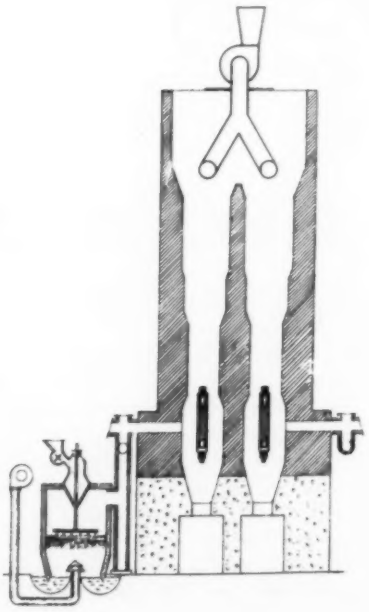


FIG. 1 (left)—Uncounted centuries of development produced a field kiln of this general design. It's still used in much of the world today

FIG. 2—Typical cross-section of the Palmer kilns at York, Pa., one of the largest kilns ever built in this country. When it was built in 1912, it made 60 tons of lime a day. Later it was improved to double its output



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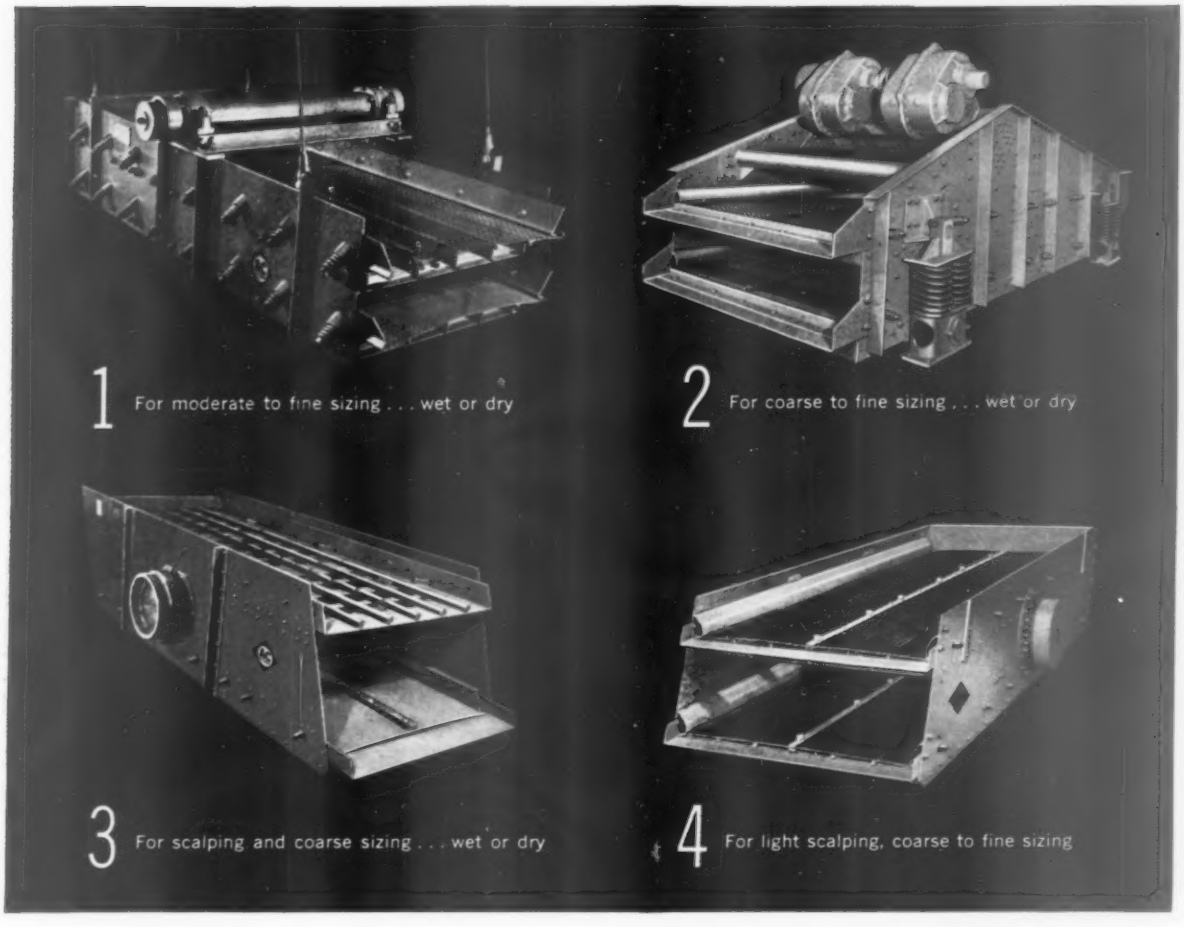

Pick a screen to fit your job

. . . be it scalping, sizing, rinsing, washing, or heavy media recovery

Large or small capacity — wet or dry crushed stone, sand or gravel — whatever your application there's an A-C screen for the job. Building the industry's most complete line of horizontal and inclined screens, Allis-Chalmers gives unbiased recommendations — suggesting to you the screen that will do your job at the lowest possible cost consistent with quality.

Built for a beating: There's no skimping on quality at A-C. For example, the frames of Allis-Chalmers screens are carefully machined and *stress relieved* for years of tough usage.

Easy to choose: A helpful screen selection guide has been prepared to help you pick the right model screen for your process. *Contact your Allis-Chalmers representative or write for Bulletin 25B6280. Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. In Canada write Canadian Allis-Chalmers, Ltd., Box 37, Montreal, Quebec.*

1 **For moderate to fine sizing** — wet or dry. AVS *Aero-Vibe* inclined screen: Available with wire cloth or perforated plate surfaces. Maximum aperture — 1½ inches. 1, 2 or 3 decks. Sizes 3 by 6 to 5 by 10 feet.

2 **For coarse to fine sizing** — wet or dry, rinsing, or media recovery. *Low-Head* horizontal screen: Saves headroom. Wire cloth or perforated plate. Apertures to 2½ inches. 1, 2 or 3 decks. Sizes 3 by 6 to 8 by 20 feet.

3 **For scalping and coarse sizing** — wet or dry. XH *Ripl-Flo* inclined screen: Wire cloth, perforated plate, rod or stepped grizzly-bar surfaces. Apertures to 10 inches. 1, 2 or 3 decks. Sizes 4 by 8 to 8 by 14 feet.

4 **For light scalping, coarse to fine sizing** — wet or dry, and for rinsing. SH *Ripl-Flo* inclined screen: Wire cloth or perforated plate. Apertures to 5 inches. 1, 2 or 3 decks. Sizes 3 by 6 to 8 by 20 feet.

Aero-Vibe, Low-Head and Ripl-Flo are Allis-Chalmers trademarks.

A-1215

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FROM PRIMITIVE TO MODERN IN FIFTY YEARS

continued from page 124

Firing started at the rate of 60 liters of fuel oil and increased to 320 liters per hour. Oil consumption was 280 liters per tonne or 82 gallons for a short ton, about 12 million Btu's., a kiln thermal efficiency of 24 percent. Fuel requirement is high but not as high as one would imagine, particularly as there are rotary kilns using 12 millions as well as some hand-fired shaft kilns. It is the amount and heavy, hot dirty kind of labor that condemned this kiln in preference to almost any other.

Intermittent kilns were followed by continuous mixed, so-called "pot" kilns. Initially they were not true mixed-feed. The charging was in alternate layers of fuel and stone. Occasionally wood was used; in some regions coal still is used, but this system does not lend itself to efficient operation with high-volatile fuels. With coke as fuel these kilns eventually became true mixed-feed, very large, of high production and some of highest possible thermal efficiency. However, coke is costly and not too readily available everywhere. Therefore, in certain countries, we converted these coke-fired kilns to gas-fired, either with gas produced from coal or from fuel oil, with very good results and softer burned and cleaner lime.

The literature of lime technology started in 1896, when Gen. G. A. Gilmore, U. S. Corps of Engineers, published "Practical Treatise on Lime and Hydraulic Cements." In this volume only primitive field kilns and direct-fired kilns were described; none were gas producer-fired. It was an exceedingly good book though, for the time, and the forerunner of a great technical era to come. The twentieth century opened almost immediately with a great spurt of development. It started when E. F. Defenbaugh, Editor of ROCK PRODUCTS called a meeting of some lime manufacturers to organize the National Lime Association. This was formed and became an immediate success.

At the first meeting in 1903, Charles Warner, who was destined to be a leader in lime for 50 more years, presented a splendid paper on "The Fundamental Principles of Combustion and Draft as Applied to Lime Kiln Practice." This first paper of its kind brought science and engineering into the American lime plant.

Like his older brother Charles, Irving Warner was also a great contributor to the development of the lime industry. After he presented his paper on "Cost Keeping at the Lime Plant," before the 1908 National Lime Manufacturers' Association meeting, W. E. Carson, president of the Association, remarked to the attendance:

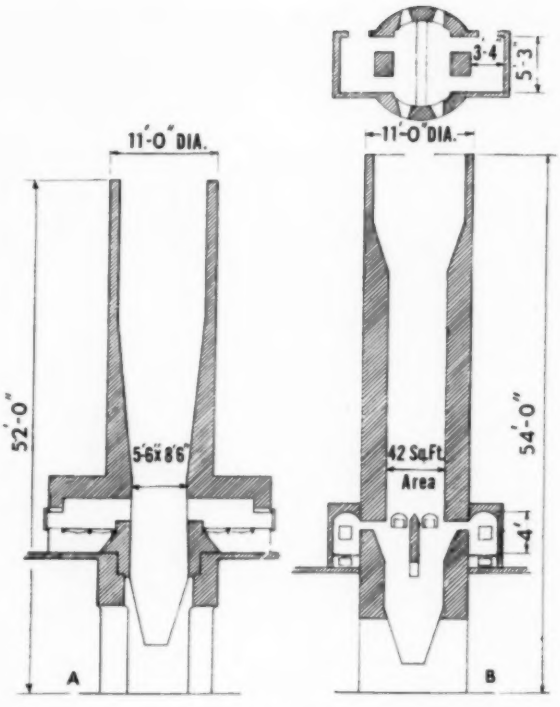

FIG. 3—Examples of early improvements in kilns. "A" was fired directly by hand, while "B" was a semi-producer gas-fired kiln

"At just this point I would also like to say that if you have any problems about your plant that you have not worked out, or anything that is giving you trouble, just simply ask Mr. Irving Warner about it. He is an expert on all questions pertaining to lime manufacture and, I think, he can give you good advice, good information."

It was a sincere tribute by a highly respected man. It also was justified, since Irving Warner was technically well-endowed and then knew both the European and American practices.

About this time in Germany, there was a designing genius, Ernest Schmatolla, who was active in construction of various kinds of kilns—including gas producer-fired. In 1906 Irving Warner visited Schmatolla and made professional arrangements with him. Later, Schmatolla came to this country where he remained active in the capacity of consulting engineer to the more advanced group of lime producers, such as Warner, Carson, Cobb, etc.

Although Warner and Schmatolla were both of

Please turn to page 128

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New Lubritrol system provides constant lubrication for trunnion bearings

The new, bigger A-C grinding mills actually *float on oil.* Process industries are grinding out bigger profits because of *Lubritrol* constant lubrication system. No bearing-wearing starts. No dry sliding after shutdown. Less wasted horsepower. All functions of the *Lubritrol* system are automatic...controlled by foolproof pressure gauges and switches. The system is filtered to remove contaminants.

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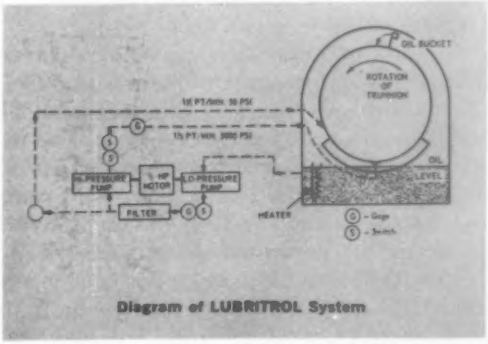

Diagram of LUBRITROL System

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FROM PRIMITIVE TO MODERN IN FIFTY YEARS

continued from page 126

A MODERN ADAPTATION of the field kiln in Israel yields 85 tons of lime every 12 days with more than 50 man-days of onerous labor

an independent spirit of mind, they stimulated each other as well as exerted great influences over others. Thus, in this period some of the largest kilns ever, came to be built and other lime plant developments stimulated.

Schmatolla secured several U. S. patents and published numerous articles. In 1911 he applied for, and in 1913 was granted, a patent on a truly mammoth kiln having two shafts within one shell.

These were the early days of gas producers, with one or more gas producers at the head of a long line of small kilns. Warner always opposed this arrangement because of the heat loss and soot troubles of the long gas flues.

Initially, Schmatolla favored his old German system of gas producer built into the kiln structure with both the gas producer and the kiln working on controlled natural draft. The peculiarity of all his kilns was that they had a closed top and, rather than a fan, a damper to control escape of gases. The kiln then was under hydrostatic pressure that prevented air from entering the kiln at the top. It was a good system. For low production up to about 1,000 lb. of lime per sq. ft. of shaft area, it was entirely correct. For higher production, mechanically created draft would have been necessary.

In 1909 Warner Co. built their very large No. 21 kiln. It had a shaft 7 x 16 ft. in area and was 82 ft. high. It was built this large to justify its own gas producer. The kiln produced 54 tons of dolomitic lime per day, more than any kiln up to that time. It was induced-draft operated, the first of its kind.

The kiln did not produce more because the gas producer could not gasify enough coal. The air blast was induced by a steam jet, with steam generated in the gas producer jacket. Since the fuel bed varied in temperature, the amount of steam varied and the air blast fluctuated widely. For a limited amount of gas the kiln shaft area was by far too great and, particularly, too wide; the gas did not enter with sufficient force to reach across the 7-ft. span. The induced draft fan was then disconnected and the kiln operated by Schmatolla principle on natural draft. It then performed fairly well, but only the very best operators could handle the large kiln.

In 1915 Dr. A. Zimmerman applied for a patent on a double-shafted kiln, which was granted in 1916. The kiln was similar to, and no doubt was patterned after, Schmatolla's double kiln, with proportions better, a gas producing system and a fan exhaust system included. Two of these double kilns were built for Palmer at his York, Pa., plant. They were enormous as to size and failure.

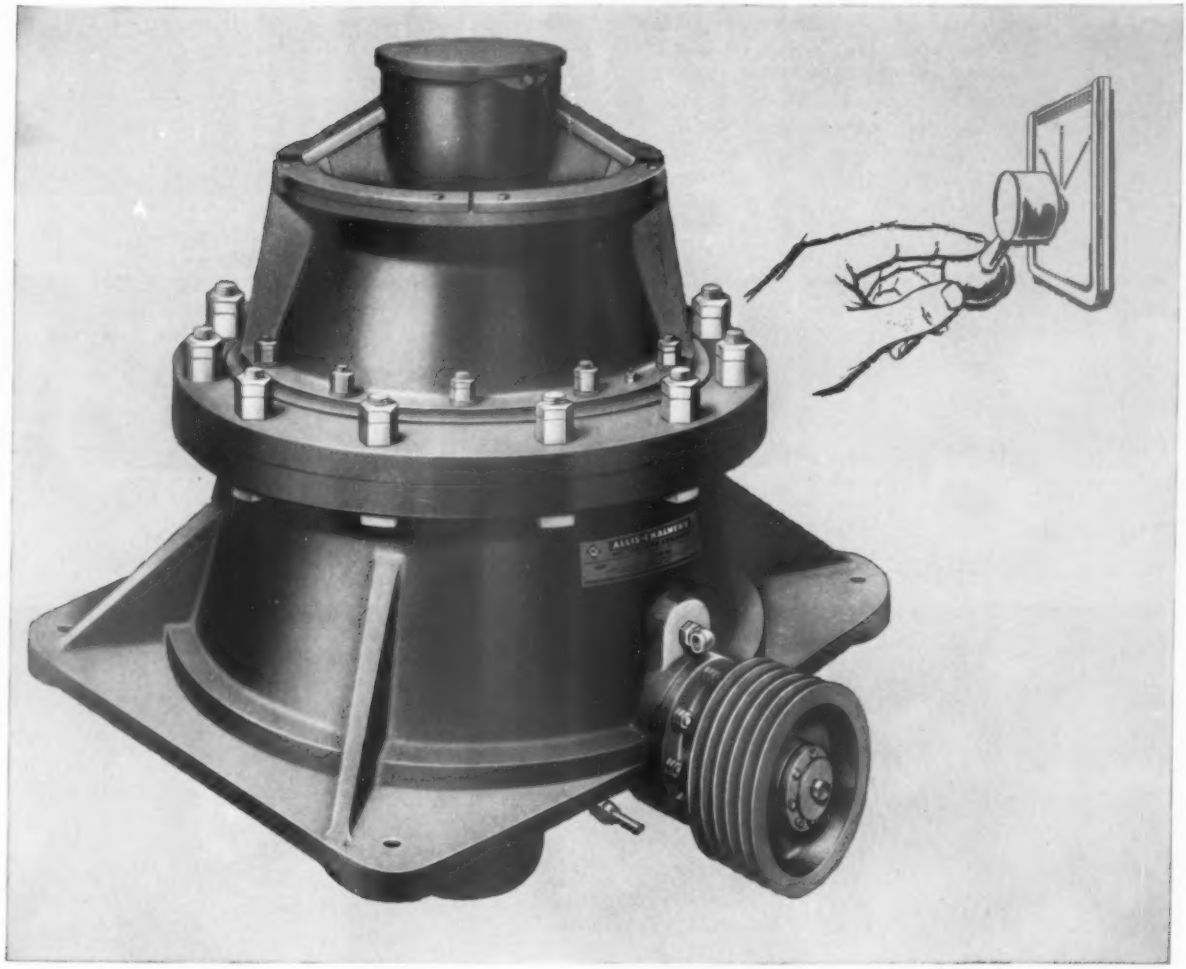
Fig. 2 shows one of these, one of the largest kilns ever built in this country. A 30 by 30 ft. fortress-type concrete foundation was 25 ft. high. On this was a steel shell 24 ft. in. diameter containing two 6 by 15 ft. shafts, for a total of 180 sq. ft. of cross-sectional area. What complex convection currents there must have been within such large kilns! Mr. Warner, well familiar with his own very large kiln and no timid soul in any sense, would say, "The Palmer kilns always scare me."

Only about 60 tons of lime per day were produced, less than 700 lb. per square foot! What disappointment they must have been. If they had disconnected the fan and applied the Schmatolla system of pressurized operation, results would have been better. But this was not thought of, or possibly was resisted because it did not appear to be logical. But under the conditions prevailing, it would have been better. The kilns were operated in this way for 15 years before I found ways to correct them.

Fig. 3 shows the common type of continuous

Please turn to page 136

ALLIS-CHALMERS



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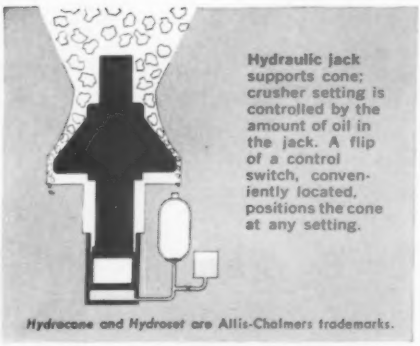
Get all the facts about the *Hydrocone* crusher with *Hydroset* control. See your A-C representative or write **Allis-Chalmers,** Industrial Equipment Division, Milwaukee 1, Wisconsin. A-1240



Hydraulic jack supports cone; crusher setting is controlled by the amount of oil in the jack. A flip of a control switch, conveniently located, positions the cone at any setting.

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WHICH EXPLOSIVE?

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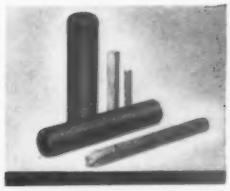

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18 x 36	132	91	62½	67½	2.1	1.4	50%
24 x 36	200	141	87½	94	2.3	1.5	53%
30 x 42	300	212	115	133	2.6	1.6	62%
42 x 48	580	456	200	200	2.9	2.3	26%

*Figures from latest available specifications of Smith, Universal, Lima, Diamond, Iowa, Pioneer, Rogers, and Gruendler, wherever same or comparable sizes exist, and at equivalent discharge settings. To simplify chart, median figures are used where specifications are given in a minimum-to-maximum range.

facts beat claims... and these published facts — backed by field performance records — put real substance behind Grizzly-King's reputation for lowest-cost-per-ton. Chart shows how Lippmann Grizzly-King gives you up to 41% more rated tonnage capacity... up to 62% higher power-efficiency... than the average of leading competitive machines of same jaw-size rating!

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2 new products for mining and quarrying: (1) Koehring® 205 SKOOPER — a full-revolving, free-swinging 2-yard loader that crowds, hoists, swings, dumps, then swings back to digging position *without traveling*. Crowds bucket along a 7-foot level cut from *"stand-still"* position, or digs at any angle of bank slope. (2) That big hauler is the new Koehring *15-ton* Dumptor® — with 2-way controls, pivoting seat, 24 mph speeds in *both* directions for *no-turn* hauling. 30,000-lb. payload capacity. 28½% gradability. *Instant* gravity-dump or *controlled* gravity-dump by hydraulic cylinders.

KOEHRING
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Brantford, Ontario

Rocky overburden on steep, mountainous site made stripping conditions as tough as they come at this coal mine. No job for ordinary equipment! So, mine owner brought in a Koehring heavy-duty 1205 rock shovel, with results shown above. It's equipped with 3-yard dipper on 30-foot rock-type boom. Also available as *high-lift shovel* with 2½-yd. dipper on *50-foot* boom; 3-yard on *40-foot* boom.

Long-reach dragline loads sand and gravel out of deep, water-filled pit. It's the Koehring 805 — a special-size that fills an important production gap on many mine and quarry operations. Depending on weight of materials, 805 handles 2 to 3-yard dragline bucket on 50 to 150 feet of boom. What's more, this high-production 805 readily converts to clamshell crane, 52-ton lift crane, or 2-yard shovel.

Always on the go — Wherever there's a heavy load to lift, machinery to install, materials to stockpile, big mobile 545 truck crane is *there* in a matter of minutes — puts all scattered assignments on a fast "work-and-run" basis. Lifts up to 45 tons with 40-foot boom *at 15-foot radius!* Angle indicator on boom, plus reference guide in crane cab, quickly show maximum safe lift capacity for any length of boom and angle of boom being used.

Swinging a skull-cracker in stone quarry, heavy-duty crane pulverizes oversize slabs and chunks of blasted rock. It's a profitable way to speed shovel loading, step up production at the crushing plant. The crane is a Koehring crawler-mounted 305. Truck or Cruiser mounting also available. As a self-propelled Cruiser® crane, the 305 combines one-man operation with travel speeds up to 18 mph — serves several widely-separated mines or work areas. Puts scattered material-handling, lifting jobs on a fast work-and-run basis. Lift capacity? 25 tons at 12-foot radius!

Get more work capacity per dollar of equipment investment — check Koehring before you buy your next excavator or crane.

A16

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NATIONAL LIMESTONE INSTITUTE

continued from page 110

it should be arranged so that each man can keep close contact with customers.

"Why can't we glamorize rock?" asked Arthur Alvis of Missouri. In this age when other products or services are given glamor to increase sales, he can see nothing wrong with selling limestone as "calcium nuggets," if it will boost sales. He compared this possibility with the progress that dentists have made in their own business. They started with pulling a tooth for 25 cents. Then they called it an "extraction" for maybe twice the cost. Adding anesthetics changed the name of the process to "painless extraction," and the price went up. Now, Mr. Alvis indicated, the name is "dental surgery" and the sky's the limit.

Chairman of NLI for the coming year is Arthur R. Alvis, Alvis Limestone & Concrete Products, Inc., Butler, Mo. The first vice chairman, representing CLD, is L. R. Falk, L. R. Falk Construction Co., St. Ansgar, Iowa. Second vice chairman, representing ALD, is William J. Clark, Munnsville Limestone Corp., Munnsville, N.Y. J. B. Mount was elected to a three-year term as secretary-treasurer, Robert M. Koch was elected president and Samuel Omasta was elected vice president.

The Manufacturers' Division elected C. W. Mayer, Bradley Pulverizer Co., as its new chairman.

END

FROM PRIMITIVE TO MODERN

continued from page 128

lime kiln used during the early years of this century. They were continuous kilns but not at all a satisfactory substitute for the intermittent kiln. These kilns usually had a wide open top, were operated on natural draft, and hand-fired with either wood or coal at up to one-hour intervals. With hot coals on the grate, there was a sudden evolution of volatile matter at each firing. The result was a pillar of smoke rising high into the sky, with secondary combustion flame often noted within the smoke.

Stone was charged to the kiln only about twice a day. Having received no stone during the night, by morning the stone in the kiln was red hot, the gases escaping at 1500 deg. F.

No air was allowed to pass through the cooler. Actually this was more like a soaking pit, an advantage in this case. The lime draw gates had to be plastered shut. If any air was allowed to come up, the flame of the furnaces flashed back on the firing floor. The lime was drawn nearly white hot and spread on the floor to be cooled and cored.

The fire was permitted to burn down before each draw; after drawing, the grates were cleaned and the kiln trimmed. If a hard hang occurred, the kiln cooled off during the hour or two it took to poke it down.

A kiln would produce from 2 to 3 tons of lime per ton of coal, about 25 percent thermal efficiency. Production was from 8 to 15 tons of lime per kiln day and, no matter what the effort, the results would not materially improve. Frequent firing helped, but improvement was fractional. Operation was continuous in a way, but actually it was not. The charging of stone twice a day was not continuous in any sense, the drawing of lime at up to six hour intervals was not and neither was the firing. There was too much fuel for the air flowing through the kiln, resulting in incomplete combustion and high CO loss; or not enough, resulting in high excess-air loss.

The Schmatolla principle of pressurized operation was forgotten; most kilns were gaping open at the top. There was loss of the heat in hot lime and loss of the heat in the hot exhaust gases, and to it all there seemed no solution even after years of struggling. However, there were studies, and gradually an understanding dawned. **END**

Editor's Note: The second article in this series will describe the "breakthrough"—when the principle of having combustion take place right in the stone was applied to practice.

ROCKY'S NOTES

continued from page 18

ture, humidity and other conditions of environment. Consequently, hardened portland cement paste can hardly be said to be in a stable crystalline state—from a mineralogist's standpoint.

To get back to the book itself, we find the chapter on crystallography about the most understandable we have come across. Probably no layman can get an adequate knowledge of this subject without laboratory work with minerals. On the other hand, no layman can understand discussions on cement research without some acquaintance with the subject. It has played an important part in the identification of the components of portland cement. Discussion of crystallography occupies the first 144 pp. of the book.

The next chapter is a discussion of physical mineralogy, which is a more or less standard description of such characteristics as cleavage, parting, fracture, specific gravity—all the common methods used to identify minerals. Then follows the chapter on chemical mineralogy, referred to above, and containing a new and refreshing discussion for

Please turn to page 140

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ROCKY'S NOTES

continued from page 136

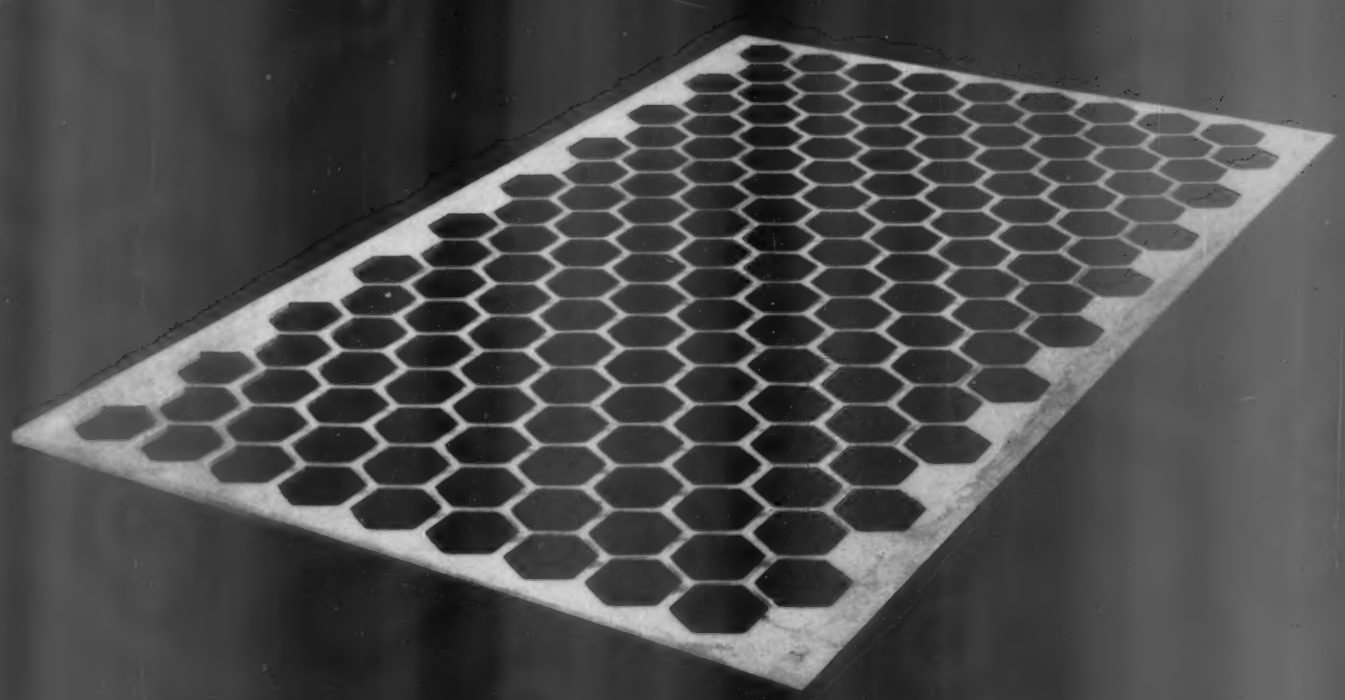
all of us interested in inorganic chemistry. We really do not know much about chemistry—modern inorganic chemistry—until we have become familiar with the structure of the elements, and the structures of the crystals or molecules formed by combinations of its elements. The important thing in the study of these mineral organizations is the kind of bond which holds them together.

It can be seen that while this is readily determined in the case of a simple mineral compound like salt—NaCl—it becomes very difficult with a compound like cement, or even the calcium-silicate part of cement, because any impurities, and there are plenty in the calcium silicates of portland cement, change the structure, the bond strengths, etc. And then, of course, there must be some kind of a bond between the cement and the aggregate. What is it; how is it affected by the physical and chemical characteristics of the aggregate; the amount of water present; the cement itself, whether it is going to harden with an excess or deficiency of positive or negative electrostatic charge, etc. This chapter consists of some 80 pp. that we believe any interested reader can absorb without too much effort.

The rest of the book is descriptive mineralogy, arranged in the usual classifications. Of course, we are primarily interested in the silicates, since portland cement and concrete, if they can have any mineralogical classification, must be primarily silicates. Our author says that "the silicates constitute well over 90 percent of the earth's crust." And, we would guess that description includes the part of the earth's crust covered with ribbons of concrete pavement! It is also stated that we can picture the earth's crust "as a boxwork of oxygen ions bound into configurations of greater or lesser complexity by the small highly charged silicon and aluminum ions. The interstices of this more or less continuous silicon—aluminum network are occupied by ions of magnesium, iron, calcium, sodium and potassium in coordination states proper to their individual [ionic] radii."

That has long been our own conception of the earth's crust—and incidentally of concrete. Because portland cement is an outgrowth or evolution from lime, the earliest masonry cement, emphasis has always been on the lime ingredient. We still aim for a "lime-saturated" compound, or mixture. Yet, it is obvious from an acquaintance with mineralogy, that it is the network of silica tetrahedra, or the silicate lattice, that is the real bonding agent of the earth's crust. In our unorthodox conception of the nature of portland cement, the

Please turn to page 146



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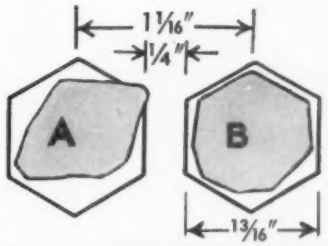

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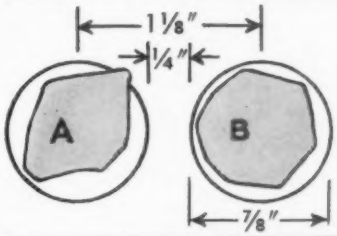
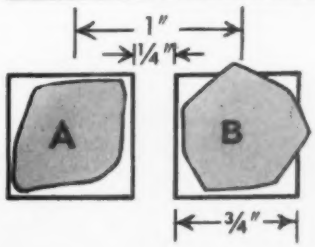


7/8" Round Rejects A, Passes B, has 54.8% open area.



3/4" Square Passes A, Rejects B, has 56.3% open area.

Tandem trailer units, with a Mack LRX Model doing the hauling, keep the pressure on 3¼-yard electric shovel at the Maryland quarry of North American Cement Corporation.

MACK
for over 7 straight years
NO. 1
by far in sales of diesel trucks

Maneuverability and ease of handling are Mack features which have made them favorites for heavy-duty quarry work. Here 28 tons of rock is unloaded at the crusher located a half-mile from quarry face.

At the Security Plant of North American Cement Corporation...

TWO MACKS

handle half a million tons of rock per year

North American Cement Corporation has jumped hauling capacity and still kept down costs at its Security Plant in Hagerstown, Md., by coupling full trailers with LRX Model Macks. Each of the two rigs now handles 28 tons at a clip—together they will move 500,000 tons of limestone this year.

The quality of Mack-built engines, transmissions, and clutches helped sell North American Cement on Macks—for, like suspensions, rear axles and other vital components, they are engineered and built by Mack for Mack trucks alone. Mack has manufactured its own components—to the highest standards in the industry—for over 60 years. Manufacturing craftsmanship and the famous Mack practices of Balanced Design account for the fact that a Mack truck will stand up under fast-moving shovels, heavy loads and poor going better than any vehicle in its class. Wouldn't these qualities be valuable in your operation? Your nearest Mack branch or distributor is the man to see. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.

2414

MACK
FIRST NAME FOR
TRUCKS

WESTERN PRECIPITATION'S

NEW THERM-O-FLEX COLLECTOR

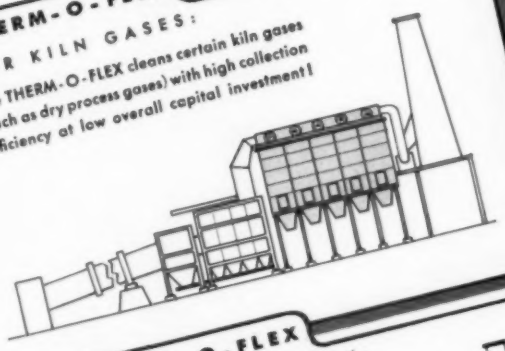
CLEANS GASES TO 550°F

with VIRTUALLY 100% COLLECTION!

THERM-O-FLEX

FOR KILN GASES:

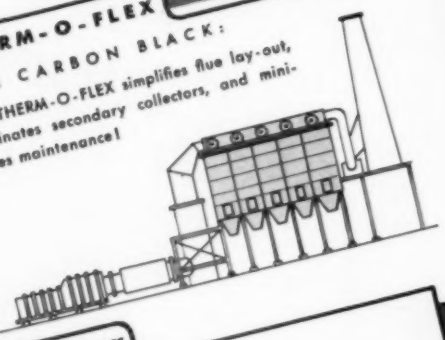
The THERM-O-FLEX cleans certain kiln gases (such as dry process gases) with high collection efficiency at low overall capital investment!



THERM-O-FLEX

FOR CARBON BLACK:

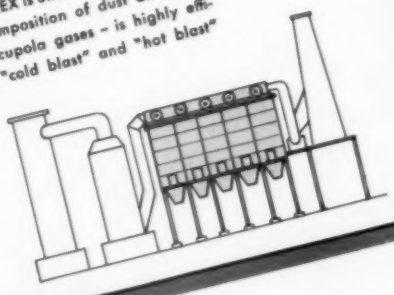
The THERM-O-FLEX simplifies flue lay-out, eliminates secondary collectors, and minimizes maintenance!



THERM-O-FLEX

FOR CUPOLA GASES:

The THERM-O-FLEX is unaffected by the varying chemical composition of dust and fume particles from cupola gases – is highly efficient on both "cold blast" and "hot blast" processes!



Western-Precipitation brings another important new advancement to the gas cleaning field — the THERM-O-FLEX Collector — a filter type of unit with many advantages over conventional filter equipment...

▶ The THERM-O-FLEX features glass silicone treated filter tubes that efficiently handle gases as hot as 550° F!

▶ The THERM-O-FLEX tubes are cleaned *automatically* by intermittent collapsing (not by destructive shaking). This assures uniformly low pressure drop combined with long filter life!

▶ The THERM-O-FLEX has *no moving parts* — nothing to require frequent servicing or replacement!

RESULT — highest collection efficiency combined with lower cost, less maintenance and uniformly low pressure drop on a wide range of applications, a few of which are shown at left.

Let Our Experienced Engineers study *your* dust or fume collection problem — *large or small* — and show exactly how **THERM-O-FLEX** gives new standards of performance at low installation costs. No obligation, of course!

HELPFUL NEW BULLETIN describes multiple Therm-O-Flex savings, outlines applications, technical data. *Ask for Bulletin #F105!*

Only WP has All 6

1. COTTRELL Electrical Precipitators
2. MULTICLONE Mechanical Collectors
3. CMP Combination Units
4. DUALAIRE Jet-Cleaned Filters
5. THERM-O-FLEX Hi-Temp Filters
6. TURBULAIRE-DOYLE Scrubbers

Also: HOLO-FLITE Processors
HI-TURBIANT Heaters

WESTERN PRECIPITATION

DIVISION OF JOY MANUFACTURING COMPANY

Engineers and Constructors of Equipment for Collection of Suspended Material from Gases . . . and Equipment for the Process Industries

LOS ANGELES 54 • NEW YORK 17 • CHICAGO 2 • PITTSBURGH 22 • ATLANTA 5 • SAN FRANCISCO 4

Representatives in all principal cities

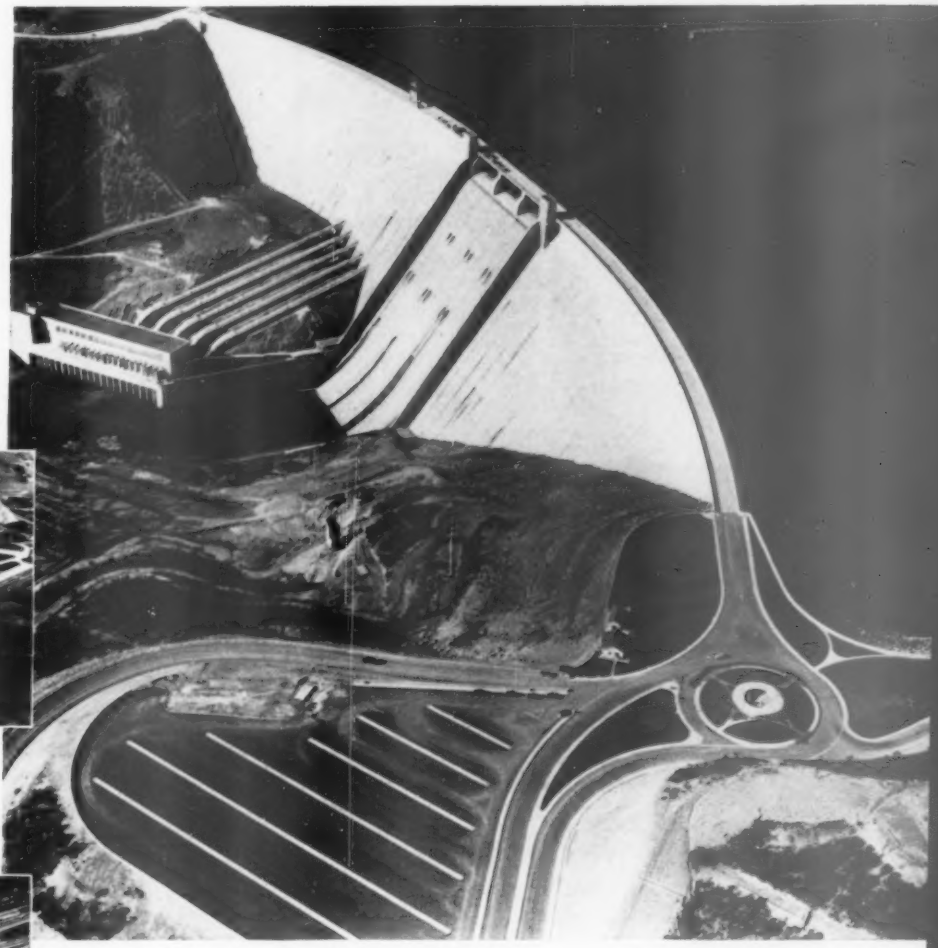
Precipitation Company of Canada Ltd., 8285 Mountain Sights Avenue, Montreal 9

Enter 1274 on Reader Card

Enter 1275 on Reader Card ▶

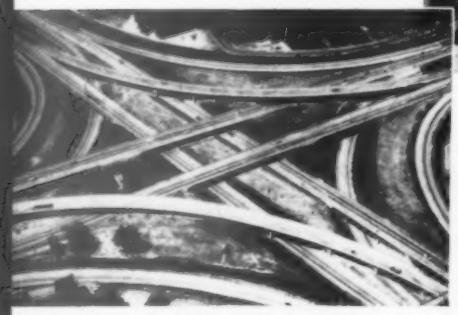
SYMONS® CONE CRUSHERS

FIRST CHOICE for big volume–low cost production of quality Crushed Sand and Aggregate



Right: This dramatic view of Shasta Dam in California demonstrates the progress made by construction engineers in conserving water supply, preventing flood destruction and providing water needed to make arid land useful again.

Above: To meet the challenge of the jet age, engineers and contractors are being called upon to build and expand airport runways to handle increased traffic. (View shows Lambert Field, St. Louis.)



Above: This view of one of the interchanges on the high speed Detroit expressway is a striking example of the contribution the construction industry is making to the tremendous highway program.

In aggregate and sand production . . . *as in all of the great ore and industrial mineral operations the world over* . . . there has been no record to equal the performance of Symons Cone Crushers that have so consistently and efficiently produced great quantities of finely crushed product at low cost.

Whether you are a contractor, operator, construction engineer, designer or manufacturer, it will pay you to specify and use Symons Cone Crushers for primary, secondary, or finer reductions, in capacities to over 900 tons per hour. Write for literature.

NORDBERG MFG. CO., Milwaukee 1, Wisconsin

C-258-R

NORDBERG

SYMONS . . . a registered Nordberg trademark known throughout the world

ATLANTA • CLEVELAND • DALLAS • DULUTH • HOUSTON • KANSAS CITY • MINNEAPOLIS • NEW ORLEANS • NEW YORK • ST. LOUIS
SAN FRANCISCO • TAMPA • WASHINGTON • TORONTO • VANCOUVER • JOHANNESBURG • LONDON • MEXICO, D. F.

ROCKY'S NOTES

continued from page 140

lime is largely a means to the end of establishing, when and where it is desired, a silica-alumina network to bind together not only the ions of other common minerals, contained in the ground clinker, but the much larger particles of aggregate.

It is a matter of ancient history, that a drill hole in rock, filled with quicklime to which water is subsequently added, will heat, expand and crack the enclosing rock. Lime has been so used as an "explosive." In cement clinker we have minute grains of quicklime enclosed in a more or less fused matrix of silicates and aluminates—"a boxlike network of oxygen ions bound into configurations of greater or lesser complexity by small highly charged silicon and aluminum ions." Very much like the igneous rocks in nature except for the disproportionate amount of CaO. When water is added to this pulverized matrix, the lime (CaO) speedily hydrates, with an "explosive" effect on the minute particles of enclosing "silicate," rendering the silica (SiO_2) reactive, in the presence of the lime-water solution, to form colloid particles with an active, negatively charged surface.

These colloid particles are many times larger than single cells or crystals of silica, but complex silicates are formed from them, as they are in many kinds of natural rocks, by reaction between mineral atoms or ions and the colloidal silica. Much more lime is used in modern portland cement mixtures than can be acted upon or adsorbed by the silica, largely to speed up the reaction suggested above, but at the expense of a subsequent neutral or stable product. The excess calcium hydroxide ($Ca(OH)_2$) is, of course, notoriously reactive with such gases in the atmosphere as carbon dioxide (CO_2), sulphur dioxide (SO_2) and others in the neighborhood of industrial operations. Moreover, $Ca(OH)_2$ is reactive with the salts in both seawater and some so-called fresh water.

So, whether we consider the addition of pulverized slag or a pozzolan as a method of sopping up the excess $Ca(OH)_2$ or a necessary ingredient, it does provide the silica for a larger boxwork of connected silica tetrahedra, and consequently a stronger and more permanent binder. The same reactive kind of silica in the cement would serve the same purpose, but at the expense of more time for hydrating, setting and hardening. However, those reactions could be hastened by the introduction of a very small percentage of some agent that would promote the production of silica gel, such as sodium or potassium hydroxide or carbonate. Apparently one may anticipate an "alkali-aggregate" reaction only when there is a deficiency of reactive silica or silicate, well distributed in the finest ground form, or in the presence of a surplus of both $Ca(OH)_2$ and NaOH. **END**

BUELL-NORBLO
TWO GREAT NAMES
ONE GREAT LINE
OF DUST RECOVERY EQUIPMENT

With the acquisition of The Northern Blower Company, Buell can provide a broad range of products and systems for handling every industrial dust and air pollution problem. Norblo bag type collectors now augment Buell Cyclones and other mechanical collectors, electric precipitators, combination systems and centrifugal and gravitational dust classifying systems. And like Buell, Norblo has been accepted and proved through years of experience in active, on-the-job service. Thus Buell is better able to meet both standard and special requirements in fields that include the electric utilities, steel, oil, cement, chemical, paper, and other process industries. Buell Engineering Company, Inc., 123 William Street, New York 38, New York. Northern Blower Division, 6404 Barberton Avenue, Cleveland, Ohio. (Subsidiary: Ambuco Limited, 2-5 Old Bond Street, London, England)

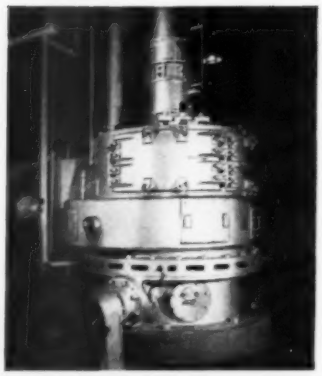
Enter 1281 on Reader Card

B&W Pulverizer Fires 12 x 450 Ft. Kiln Efficiently, Dependably

Unit Pulverizes from 204 to 216 Tons Daily of Coal Containing as much as 12% Moisture

A B&W EL Type Pulverizer enables the Cape Girardeau Plant of the Marquette Cement Manufacturing Company to direct-fire continually one of the largest kilns in the industry. They operate their pulverizer on a 24-hour day, 7-day-week basis and meet all production requirements. And — after well over two years of rugged grinding service this sturdy pulverizer has never caused an unscheduled plant shut-down.

Throughout the cement and rock products industry, performance records like that turned in at the Cape Girardeau Plant, have earned B&W Pulverizers a reputation for dependable, efficient, and economical grinding service. If you're thinking of building a new cement plant or perhaps modifying your existing facility, a B&W Pulverizer can help you cut operating costs and improve over-all plant efficiency. For the complete story, get in touch with your local B&W representative, or write The Babcock & Wilcox Company, Boiler Division, Barberton, Ohio.



B&W EL Type Pulverizer at Marquette Cement Manufacturing Company has ground an average of over 72,000 tons per year since its installation. No unscheduled shut-downs required for maintenance.

C-220

B&W

THE BABCOCK & WILCOX COMPANY

BOILER DIVISION

Enter 1282 on Reader Card

READER-SERVICE CARD

RP-3-60

ROCK PRODUCTS
79 W. Monroe St.

MARCH, 1960
Chicago 3, Illinois

Cannot be serviced after May 1, 1960 postmark.

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Send information on items identified by key numbers beside or below items of interest to you. List your choice in numerical order. Limit 10 per card.

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ROCK PRODUCTS
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MONEY-MAKING IDEAS FOR YOU - - - FREE

HOW TO USE THIS SERVICE

1. **Advertised Products**
2. **New Machinery**
3. **New Literature**

There is a wealth of valuable information in the manufacturers' booklets offered in this issue. For your convenience, each advertisement, each new machinery and new literature item has been given a key number. Simply fill in the proper key number in the appropriate space on the card above and send it to us. We'll do the rest.

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READER-SERVICE CARD

RP-3-60

ROCK PRODUCTS
79 W. Monroe St.

MARCH, 1960
Chicago 3, Illinois

Cannot be serviced after May 1, 1960 postmark.

Please print or type

Name _____ Position _____

Company (In Full) _____

Company Address _____ City _____ Zone _____ State _____

Send information on items identified by key numbers beside or below items of interest to you. List your choice in numerical order. Limit 10 per card.

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MONEY-MAKING IDEAS FOR YOU - - - FREE

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There is a wealth of valuable information in the manufacturers' booklets offered in this issue. For your convenience, each advertisement, each new machinery and new literature item has been given a key number. Simply fill in the proper key number in the appropriate space on the card above and send it to us. We'll do the rest.

New steels are born at Armco

consistently

UNIFORM

fine grain structure

You can depend on it. Sheffield's alloying, forging and heat treating techniques assure a uniformly dense grain structure—a fine balance of hardness and toughness—right to the very core of every Moly-Cop Ball. That's why Moly-Cops retain their sphericity longer, to give you a better, longer grind at the lowest cost per ton.

The Standard of Comparison Around the World

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ARMCO
MOLY-COP
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Grinding Balls

SHEFFIELD DIVISION

Sheffield Plants: Kansas City, Houston, Tulsa

ARMCO STEEL CORPORATION

OTHER DIVISIONS AND SUBSIDIARIES: Armco Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

Enter 1283 on Reader Card

NEW LITERATURE

FOR FREE INFORMATION on these items, simply fill out and mail the postage-paid Reader Service Card found elsewhere in this issue

Spherical roller bearings

LINK BELT CO. describes its new line of special roller bearings in a comprehensive 52-page booklet. The illustrated publication describes all design features, including comprehensive selection data and formulae, shaft bearing seat diameters, lubrication information, shaft details and bearing load rating, photographs and charts.

Enter 600 on Reader Card

Centralized lubrication

LINCOLN ENGINEERING CO., Div. of The McNeil Machine and Engineering Co., has issued a 16-page brochure, "A Report to Management," that explains the advantages of centralized lubrication over manual methods. Included are five practical steps for converting to automatic lubrication and three economic areas of plant management.

Enter 601 on Reader Card

Light-meter switch turns on plant lights automatically

SCHACHT ELECTRONIC MANUFACTURING CO. has released a data sheet describing its new Lightguard electronic switch which automatically turns plant lights on at dusk, off at sunrise. Designed to turn off at 10 foot-candles of light, on when the level drops to one foot-candle, the Lightguard is termed weather and temperature-proof. Described as "the smallest, most versatile automatic light-operated switch on the market," the unit is only 1¾-in. in diameter and weighs seven ounces. A built-in time delay prevents such temporary light flashes as auto lights from turning on plant lights.

Enter 602 on Reader Card

Bin and car vibrators

MARTIN ENGINEERING CO. is distributing a catalog describing its Vibrolator line of vibration inducers. The 38-page catalog gives engineering data, specs and prices. The line includes 52 sizes, ranging from a 4½-oz. model to one weighing 72 lb., for shaking hopper-bottom rail cars. Five types of power source may be specified—pneumatic, electric, gasoline, hydraulic and steam.

Enter 603 on Reader Card

Rotary drying equipment

GENERAL AMERICAN TRANSPORTATION CORP. has released Bulletin 59-L which describes its line of Louisville Rotary dryers. Well proven, the units have been in use for 60 years, the bulletin indicates. The firm's long experience with dryers, and its dryer pilot plant for study of customer problems, help the firm determine the correct design for each application.

Enter 604 on Reader Card

Rust-proofing paint

RUST-OLEUM CORP. has released "New Color Horizons," a colorful 38-page catalog called "the most comprehensive treatise on rust and corrosion control by protective coatings ever published."

A wide range of colors is available, and for a wide variety of applications. The general line of top-coat colors, called the New Color Horizons system, has 67 colors. Other systems of protective coatings: Water Resistant, Heavy-Duty Chemical Resistant, Heat Resistant, Galvinoleum (for galvanized surfaces), Floor Coating and Speedy Dry (dries to touch in less than 30 min.).

The impressive catalog gives data on surface preparation, types of surfaces, application techniques, how to estimate paint requirements, mixing, thinning and drying data, and glossary of terms.

Enter 605 on Reader Card

Instrument, control panels

BAILEY METER CO. has just issued a 16-page product specifications form. It gives details of construction, dimensions, weights, instrument mounting and accessories for six standard styles of instrument and control panels. Standard procedures for tubing and wiring are also presented, along with convenient check list for ordering or requesting quotation. Ask for bulletin G71-7.

Enter 606 on Reader Card

Crushing plant

IOWA MFG. CO. provides complete information about a portable tandem-crusher aggregate plant, newly designed to include a twin-jaw primary crusher, in its 18-page bulletin. Two pages of pictures, taken in the field, show actual operation.

Enter 607 on Reader Card

Synchronous motors

ALLIS-CHALMERS has released a bulletin on the construction features of synchronous motors which help maintain efficiency at fractional or full loads. The motors described are designed for cement and rock product industries.

Enter 608 on Reader Card

(Continued on page 154)

Enter 1213 on Reader Card

IT'S THE BIGGEST!

THE NEW LE ROI 1200 ROTARY

—world's largest portable rotary air compressor

—with cost-saving twin-unit design

Here's the giant-economy-size portable air compressor that can't be beat for capacity, flexibility, compactness — and certainly not for low-cost air power or money-saving design and performance!

The new Le Roi rotary is a portable cyclone — delivers a full 1200 cfm of air at 100 psi — plenty of power for the *big* demands of pile driving, large-hole quarry drilling, tunnel jobs, multiple pipe line rigs, shaft jumbos, or as a stand-by source of plant air. One 1200 replaces a dozen small portables — eliminates site clutter and the need for extra men and trucks for hauling—minimizes between-job delays and slashes fuel consumption and maintenance.

Twin compressors operate at 1800 rpm, engines at 2000 rpm. Unit weighs 14,700 lbs. dry, has an 18 ft. turning radius, and meets all existing state highway regulations.

Twin-unit design gives you two individually-controlled compressors that can be operated separately for 600 cfm or together for 1200 cfm output. It permits one unit to be shut off when air demand falls below 600 cfm, or for servicing, without interrupting work. Compressors can be alternated to reduce wear — interchangeable engine and compressor parts provide added protection against costly emergency shutdowns in the field.

Get the complete design-performance story from your Le Roi distributor. He'll be glad to send you literature — and even happier to put the new 1200 rotary through its paces for you.

PC-802

LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Newmatic air tools, portable and Tractair® air compressors, stationary air compressors. Write us for information on any of these products.

WABCO

NEW LITERATURE

(Continued from page 152)

Conveyor chain design

MOLINE MALLEABLE IRON CO. has compiled an illustrated manual as a comprehensive engineering reference book for use in the selection of chain for conveyors and elevating. Correct application of chains to conveyor systems, development of attachments to increase their versatility and factors in selecting chains are outlined and illustrated. Also included are comparison charts containing principal features of the most popular types of chains, graphs of friction coefficients, and other data correlated to provide a concise reference for the design engineer.

Enter 609 on Reader Card

Shovel-crane line

INSLEY MANUFACTURING CORP. is distribuitng literature on its line of excavator-cranes. Available as shovels in sizes ¾ to 1½ cu. yd., and as cranes from 20 to 35-ton capacity, the units are mounted on either rubber tires or crawlers. Features include rugged design, good balance and visibility.

Enter 610 on Reader Card

V-8 truck

DIAMOND T MOTOR TRUCK CO. has released illustrated literature with complete specifications on the company's two new conventional V-8 gasoline models. Both are powered with "wet-sleeve", valve-in-head engines.

Enter 611 on Reader Card

Spray valves

FARVAL CORP. affiliate of The Cleveland Worm & Gear Co. has published a brochure called "The Safe . . . Sure Method for Gearing Protection." The illustrated booklet delineates the spray control valve's sequence of operation, along with diagrams of two systems for operating it: the manual and the automatic.

Enter 612 on Reader Card

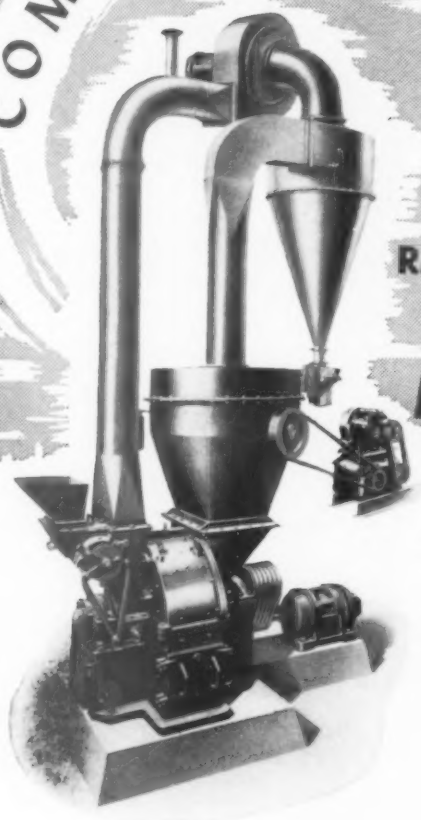
(Continued on page 156)

COMPLETE CYCLE OF OPERATIONS

GRINDING
BLENDING
SEPARATING
CONVEYING
DRYING

RAYMOND
IMP
MILL

WITH THIS AUTOMATIC UNIT



Write for Raymond IMP MILL Bulletin No. 87

The Raymond Imp Mill with Whizzer Air Separation is a general utility mill for pulverizing soft non-metallics, chemicals and manufactured products. As a compact integrated unit, it provides a clean dust-free system for reducing the material and obtaining a complete and thorough intermixture of the ingredients in finely powdered form.

It is used for the economical production of clays, phosphate materials, synthetic resins, pigments, and many specialty products. It is well suited for making different grades or changing from one material to another. Adequate access doors are provided for easy inspection or cleaning.

Imp Mills are built in several sizes to meet the capacity requirements of small and medium plants. They are economical to install, simple in operation and control with a wide range of application.

Available with Flash Drying accessories for removing moisture while pulverizing—the modern low-cost method of handling moisture-laden materials.

COMBUSTION ENGINEERING, INC.

1108 W. BLACKHAWK ST.
CHICAGO 22, ILLINOIS

Raymond Division

Combustion Engineering-Superheater Ltd., Montreal, Canada

SALES OFFICES IN PRINCIPAL CITIES

Enter 1284 on Reader Card

NEW LITERATURE

(Continued from page 154)

Blast-hole drill rig

STARDRILL-KEYSTONE CO. has released a bulletin describing its rotary-gun drilling machines. One model, the 40-BH, has 600 cfm. air supply at 100 psi., more than sufficient to operate any of the 6 to 6½-in. down-the-hole hammers, Stardrill-Keystone reports. Other features include push-button main controls, air-operated clutches and safe hydraulic raising and lowering of the mast.

Enter 613 on Reader Card

Self-propelled scraper

LETOURNEAU-WESTINGHOUSE CO. has issued a brochure on its 28-yd., 360-hp. self-propelled scraper. Special note is made of the various combinations of engine and transmission available.

Enter 614 on Reader Card

Vibrating feeders

LINK-BELT CO. is now distributing "Motorized Counterweight Vibrating Feeders," book 2869. It describes a line of vibrating feeders designed for either floor mounting or cable suspension, and ranging in capacity from 5 to 1,700 tph. Off-center mounting of the motor-driven counterweights gives a straightline conveying motion to the trough, lifting the material upward and forward, the bulletin states.

Enter 615 on Reader Card

Chain drives, elevators

CHAIN BELT CO. has just released two handbooks outlining installation, operation and maintenance procedures for chain drives (bulletin 59126) and chain conveyors and elevators (bulletin 59127).

Both pocket-sized editions give do's and don'ts the experts follow to maximize life, Chain Belt reports.

Enter 616 on Reader Card

Hose fittings, couplings

AEROQUIP CORP. has issued a catalog on hoses, fittings, self-sealing couplings and related products. The catalog includes complete specifications for use on general industrial applications. It is available with either plastic binding or punched back, for easy inclusion in parts counter record systems.

Enter 617 on Reader Card

Abrasion-resisting steel

INDIANAPOLIS MACHINERY CO. has published an 80-page handbook giving engineering data, specifications and chemical composition on the four most popular abrasion-resisting steels.

Answers to frequently asked questions are given, and the proper uses of each type of steel described. Another section of the handbook gives recommended procedures and products for welding the four steels.

Enter 618 on Reader Card

Beneficiating jig

WESTERN MACHINERY CO. has released bulletin J2-B10, describing its Wemco Remer jig. The unit removes undesired materials from fine aggregate and sand.

Enter 619 on Reader Card

Rear-dump truck

INTERNATIONAL HARVESTER CO. features its new 27-ton rear-dump, off-highway truck in a 16-page catalog. Body design, six-cylinder diesel engine, operator-designed cab and other features of this model are illustrated.

Enter 620 on Reader Card

END

When you're talking about a $162,000 dipper shovel, you've got to talk about the best rope for it

Talking about or working with, the same thing applies. Anything below Royal Blue's performance level is simply unrealistic. Like looking for a cut-price brain surgeon.

Even at $162,000, the cost of wire rope is important. That's why so-so ropes can cost you more in the long run, because so-so ropes are *short run*. Royal Blue, on the other hand, is built by America's oldest manufacturer of wire rope to last, to do the job without a whimper. Here's why.

Royal Blue is made from the toughest rope wire ever made—Type 1105—extra high-strength improved plow steel. This pedigree gives to the rope qualities that you can't find in any other rope: exceptional resistance to shock, abrasion, fatigue and impact. Add to these a flexibility that age cannot wither nor hustling fade and you've got a collection of characteristics that make Royal Blue the strongest rope you've ever used.

A $162,000 Dipper Shovel deserves the best and your Roebling Distributor has it . . . Royal Blue. For information, write to Roebling's Wire Rope Division, Trenton 2, N. J.

ROEBLING

Branch Offices in Principal Cities

John A. Roebling's Sons Division • The Colorado Fuel and Iron Corporation

Enter 1285 on Reader Card

NEW PATENTS

by OLIVER S. NORTH

Fluorspar

U. S. 2,906,618—Use of good quality **fluorspar** for lining a reaction vessel for use in autothermic reduction of uranium tetrafluoride to metallic uranium. (J. W. C. Crawford; assigned to U. S. Atomic Energy Commission)

Canadian 582,407—Use of **fluorspar, borax,** or lithium carbonate as the catalyst in the decarbonization of high-carbon ferrochromium. This patent is substantially the same as U. S. Patent No. 2,802,730, dated Aug. 13, 1957. (to A. R. Fraser and T. J. Slattery; assigned to Chromium Mining & Smelting Corp., Ltd., Sept. 1, 1959)

Clays

U. S. 2,904,267—In a method for obtaining from crude **kaolin,** e.g., Georgia kaolin, a greater proportion of material in the minus 2-micron particle size range, a water suspension of the clay is pressure extruded under optimum conditions as regards solids content, die size, and pressure. The intensive hydraulic shearing reduces the particle size by delamination of kaolin "stacks", and in addition decreases product viscosity. (to S. C. Lyons; assigned to Georgia Kaolin Co.)

U. S. 2,904,520—In the preparation of petroleum catalysts, **kaolin** is sulfated with sulfuric acid and then pelletized by extrusion, and the pellets heated to complete the reaction and then further heated in steam and hydrogen to decompose the aluminum sulfate formed. (to J. J. Donovan and T. H. Milliken, Jr.; assigned to Houdry Process Corp.)

U. S. 2,904,875—Use of **bentonite** in an electrical insulating coating applied to magnetic sheet materials. (to W. M. Trigg and B. V. McBride; assigned to Westinghouse Electric Corp.)

U. S. 2,905,643—In a method for dewatering **kaolin,** the flocculated clay-water mix is centrifuged. Effluent water is removed, and a high-specific gravity deflocculant, e.g., sodium hexametaphosphate, is fed into the partially dewatered mass as it emerges from the centrifugal zone. Thus, the viscosity of the suspension is greatly reduced at the moment of exit from the centrifuge, so that a high-solids centrifuge discharge can be handled. (to R. F. Billue and J. T. Williamson; assigned to Thiele Kaolin Co.)

U. S. 2,907,633—In the production of aluminum salts, **kaolin** is mixed with a solution of ferric sulfate, and the mixture repeatedly heated to 250 deg. C. and filtered. The filtrates are collected and combined, thus recovering virtually all of the aluminum as aluminum sulfate. (to F. Seidel and W. Singer; assigned to VEB Farbenfabrik Wolfen.)

Sylvinite

U.S. 2,919,026—In the froth flotation recovery of sylvite from Carlsbad **sylvinite** ores, the ore is pulped in a chloride-saturated solution, treated with methoxy polyethylene glycol or the like as an auxiliary reagent for slimes control and subjected to froth flotation. (to W. A. Smith, C. W. Abernethy and J. M. Downey; assigned to American Metal Climax, Inc.)

Gilsonite

U. S. 2,911,373—Use of **talc, clay** or **asbestos** in admixture with **gilsonite** or other asphaltic bitumen in the preparation of carbonaceous cation exchange materials having high exchange capacities. (to M. B. Goren, M. W. Pickell and L. Garwin; assigned to Kerr-McGee Oil Industries, Inc.)

Canadian 584,934-5—A road paving composition comprises **gilsonite,** a synthetic rubber copolymer and asphalt. (to J. E. Titley, H. C. Miller and H. R. De Vries; assigned to Dominion Rubber Co. Ltd.)

END

BLASTHOLER

ROTARY DRILL CUTS COSTS— SPEEDS BLASTING

BLASTHOLER

ABOVE: Track and tire-mounted BLASTHOLERS drilling 25′ blast holes without adding steel in a hard limestone quarry.

This self-propelled rotary drill can really start your production on the up-swing — save you money, too! 2 to 5 times faster than other cumbersome equipment, the BLASTHOLER requires only one operator, carries own air for cleaning hole. Standard BLASTHOLER drills 20′ holes 3″ in diameter without adding steel. Optional equipment gives you depths to 50′. BLASTHOLER mounts on tracks or dual pneumatic tires to meet your terrain requirements. Cut costs — speed blasting! See the BLASTHOLER today!

BLASTHOLER DEALERS

The W. W. Williams Co.
Columbus, Ohio

Reid-Holcomb Co., Inc.
Indianapolis, Ind.

Watson Equipment Co., Inc.
Pittsburgh, Pa.

Ray C. Call Co., Inc.
South Charleston, W. Va.

Illinois Road Equipment Co.
Springfield, Ill.

Williams Tractor Co.
Louisville, Ky.

Hi-Way Machinery Co.
Dallas, Texas

Bublitz Machinery Co.
North Kansas City, Mo.

James W. Bell Co., Inc.
Cedar Rapids, Iowa

Anderson Equipment Co., Inc.
Omaha, Neb.

Wylie-Stewart Co., Inc.
Oklahoma City, Okla.

Wisconsin Drilling & Equipment Co., Inc.
Madison, Wis.

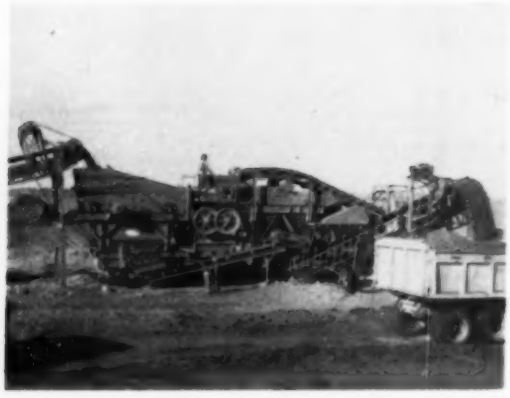
Contractors Machinery Co.
San Antonio, Texas

DRILLING ACCESSORY AND MANUFACTURING COMPANY, INC.
2006 South Industrial Boulevard
Dallas, Texas

Enter 1286 on Reader Card

NEW MACHINERY

FOR FREE INFORMATION on these items, simply fill out and mail the postage-paid Reader Service Card found elsewhere in this issue



New portable unit

The "Gravelking" is a single, one-man primary and secondary portable unit. According to the manufacturer, the new unit has achieved a capacity of more than 700 tph. of minus 1-in. material in actual production.

Outstanding feature is its large crushing capacity using a newly developed 13 x 36-in. jaw crusher. This crusher is said to produce a large volume of on-size aggregates, reducing the amount of recycled material. Primary sizing is done on a 4 x 12-ft. vibrating screen which takes out pit-run sand—only delivering oversize to the crusher. Final sizing is done on a 4 x 12-ft. horizontal vibrating screen.

Four grades of material are made—sand, gravel, all-crushed gravel and crusher dust. Production specifications are met by blending these products on the conveyors. The complete assembly is mounted to meet state highway load limits. Triple axle running gear is available, and the scalping screen and primary crusher are skid mounted for independent haulage. (Universal Engineering Corp., 625 C Ave. N.W., Cedar Rapids, Iowa.)

Enter 200 on Reader Card

Bag collector

By giving dust-laden air centrifugal velocity, much of the heavy dust is dropped out of the air stream. This results in exceptionally high collection efficiency for a cloth dust collector and reduced space requirements for this new collector, styled Roto-Jet by its maker.

Other features which add to the new unit's efficiency are a rotating blow tube with a roller support system that needs no reversing mechanisms or switches. Automatic cloth takeup aids removal of dust from the pores of the fabric; at the same time each segment of the cloth has a controlled cleaning time and controlled wrap of cloth around the blow tube.

Basic units are available to handle 1,000, 1,500 and 2,000 cfm. of dust-laden air. Larger volumes are treated by grouping the basic units in multiples. (Dustex Corp., P.O. Box 2520, Buffalo 25, New York.)

Enter 201 on Reader Card

Diesel engine

More power on the job is assured with this manufacturer's line of diesel engines with high torque rise. This feature insures that the engine will maintain the correct operating speed with little regard for changes in load. The new MP series engines are offered in sizes ranging from 105 to 320 hp. The same engines in generator sets are available from 60 to 188 Kw., or engines can be supplied with both mechanical takeoff and generator. (Murphy Diesel Co., 5317 W. Burnham St., Milwaukee 19, Wisconsin.)

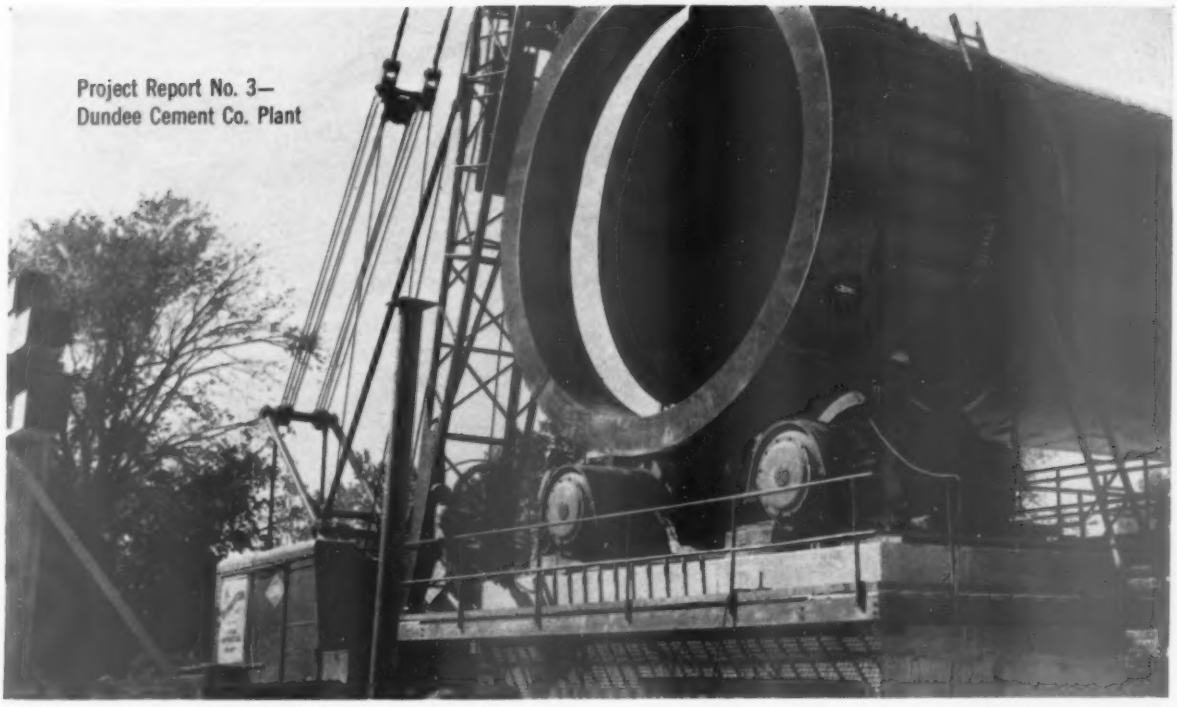
Enter 202 on Reader Card

Spray-on lubricant

Lubricants now are available in pressurized, spray-on containers. A special lubricant made up of oil, a penetrant and a rust preventive has been compounded especially for open chains of all kinds. The penetrant lets the lubricant reach between the close tolerances of conveying and elevating chain joints into the pin and bushing bearing surfaces. A free aerosol can of this lubricant is available on letterhead request. (The Whitmore Mfg. Co., Cleveland 4, Ohio.)

Enter 203 on Reader Card

Please turn to page 162



With ease and efficiency, Darin & Armstrong's crawler crane assembles one of the massive kilns. Kilns measure 16′ 6″ x 15′ x 16′ x 460′.

NORTH AMERICA'S LARGEST KILNS
help make Dundee plant one of most efficient ever built

The remarkable efficiency of the Dundee Cement Plant is best illustrated by this fact: from just 2 kilns and 5 mills the plant can produce 5 million barrels of cement a year.

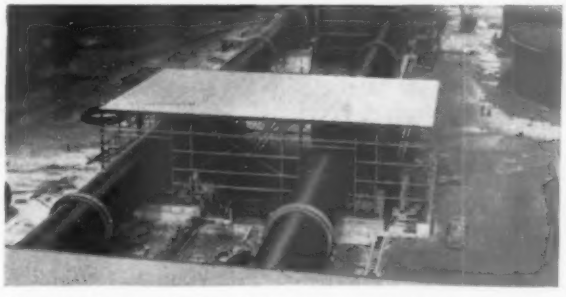
Another unusual feature of the Dundee plant is its ability to double production capacity anytime with only a slight addition of machinery—in space already provided—and a minimum extension of existing buildings.

Darin & Armstrong has met and solved all problems presented by the plant's unique design, while maintaining the erection schedule, *without overtime.*

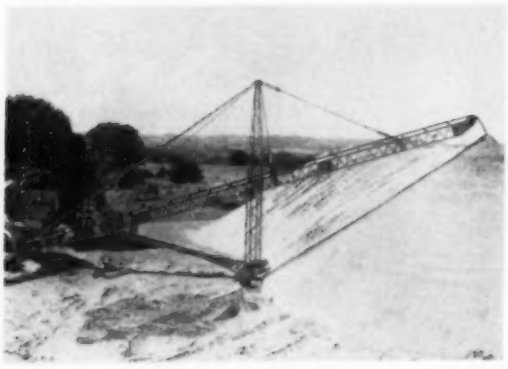
This picture report covers the kiln installations.

(for Project Report #2 see January issue)

First kiln installed. Concentration of huge machinery and buildings in small area made Darin & Armstrong's job more difficult, but contributes to plant's efficiency.



Kilns nearing completion. Each will be rotated by a 250-hp. motor at 1 r.p.m. Tremendous machinery size is characteristic of entire plant. Mills and coolers are the biggest in the world.



Radial stacker

Radial stackers are now offered as package installations. Ranging from 90 to 150 ft. centers, conveyor belt widths can be supplied from 18 to 36 in. The stacker boom can be raised or lowered with a cable suspension system to keep the end of the stacker just above the top of the pile.

Each stacker is supported on pneumatic tires to eliminate the need for precision location of steel rails. The wheels can be rotated from the radial position to parallel, converting the unit to a fully portable machine. (Kolman Mfg. Co., Sioux Falls, So. Dak.)

Enter 204 on Reader Card

New screen plate

A new pierced metal plate can often replace a conventional cloth or plate for accurate screening of fine materials. "Conidure" pierced metal is said to last up to three times longer than other screens when used for wet screening or dewatering, and screening efficiency is substantially higher. The process can be applied to sheets of aluminum, copper, stainless steel as well as ordinary carbon steel.

The new sheet is offered only for very fine screening. Hole diameters range from .004 to .099 in. in sheet thicknesses from 14 to 28 ga. These sheets can be fabricated up to 30 in. wide and can be sheared, bent, rolled or formed into a wide range of shapes after piercing. (Cross Perforated Metals, National-Standard Co., Carbondale, Pa.)

Enter 205 on Reader Card

Front end loader

This manufacturer's first entry into the wheeled front end loader market has been announced. Three separate models of the wheeled Traxcavator will be available, from 85 to 145 engine hp. New features of the line have been developed after several years of field research and testing, according to the maker. Outstanding safety feature of the new model is reported to be the novel design of the bucket lift arms. (Caterpillar Tractor Co., Peoria, Illinois.)

Enter 206 on Reader Card

Magnetic scale control

A new magnetic reed cut-off system provides accurate control for this manufacturer's scales. Its simplicity and dependability are said to greatly reduce the maintenance and repair expenses common to more complex weighing controls.

The magnetic reeds are simply iron strips sealed in glass containers which are fastened to dial pointers. A magnet and relay completes the system. When the magnet makes the reeds touch, a circuit is closed; the relay actuates heavy-duty controls which operate valves, gates or other mechanical equipment. It is possible to install a dual system to provide two-speed control of the flow of aggregates, cement or other free-flowing materials to increase weighing and cut off accuracy.

This new system lends itself to automatic and continuous control of batching, blending or multiple gate systems. (Howe Scale Co., Rutland, Vt.)

Enter 207 on Reader Card

Grease cartridge

A leakproof, disposable grease cartridge is now available. This E-Z Load unit is filled with a high-quality, multi-purpose lithium-base grease and fits all cartridge-type grease guns. Leakproof sealing prevents any contamination of the lubricant with grit or moisture. There is no loss of grease when filling, and the cartridge can be completely emptied before it is discarded. (Gulf Oil Corp., Pittsburgh 19, Pa.)

Enter 208 on Reader Card

New tractor shovel

This manufacturer has extended his line of tractor shovels to include a 1⅝ cu. yd. unit. The new Model 150 includes underslung arms for greater operator visibility and a maximum dumping height of 9 ft. The whole unit has been designed for heavy work at maximum speeds. Either diesel or gasoline engine power is available to provide 4-wheel drive speeds ranging from 3.3 to 27 mph. —either forward or reverse. (N. P. Nelson Iron Works, Inc., 850 Bloomfield Ave., Clifton, N.J.)

Enter 209 on Reader Card

Please turn to page 164

Which is the Best Screen for your job?

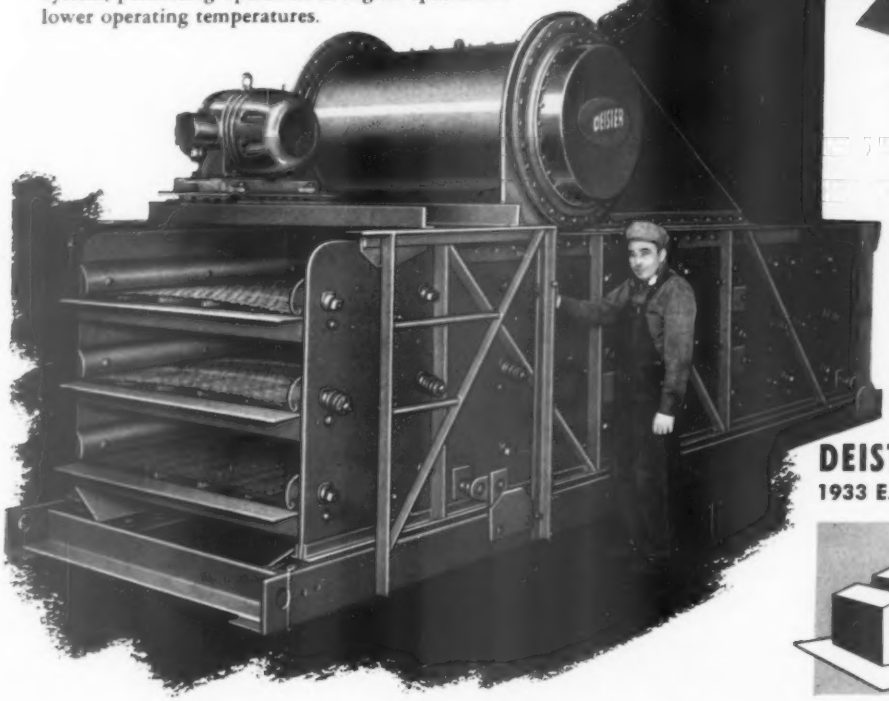
The vibrating screens you select to meet today's extremely competitive conditions must be highly specialized machines . . . designed especially to handle each of *your particular jobs*. And that's why Deister builds screens in four distinct *types* and in a complete range of *sizes*. For example:

Type UHS. Deister Type UHS Screens are built in a full range of sizes to meet any heavy-duty screening job. Extra heavy-duty types are available for scalping and coarse sizing. The Deister principle of opposed elliptical throw provides maximum capacity and efficiency in sizing. With Deister's exclusive Adjustable Slope Screen Panels, the screening angle of every Type UHS may be adjusted exactly at both feed and discharge ends to meet the specific requirements of your job.

Ag-Lime. Deister Ag-Lime Screens (Type USL) are designed to screen damp, sticky material through medium and medium fine screen cloth openings. They apply intense vibration at a relatively high frequency. For unusual conditions they are available with an Electric Screen Heater and a Ball Tray Deck.

Flat Screens (Type UF). If your plant design requires flat or horizontal screens, or if you need increased tonnage but lack the head room necessary to install larger inclined screens, investigate Deister Type UF Screens. They are also unusually effective for dewatering sand, gravel and stone.

An outstanding feature of *all* Deister Vibrating Screens is Deister's Exclusive Oil Mist Lubricating System, permitting operation at higher speeds and lower operating temperatures.

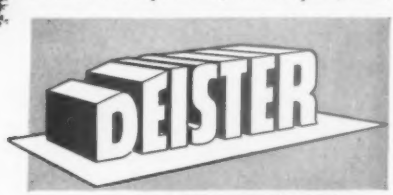


Top: Type UHS Screens are available in 3', 4' and 5' widths; in 10', 12', 14' and 16' lengths; and with single, double or triple decks.

Above: Type USL Ag-Lime Screens are built in 4' x 8' and 4' x 10' single-deck models.

Left: Type UF is built in 3', 4' and 5' widths; in 8', 10', 12', 14', 16' and 18' lengths; in single, double, triple and four-deck models.

DEISTER MACHINE CO.
1933 E. Wayne St., Ft. Wayne, Ind.



Enter 1288 on Reader Card

continued from page 162

Motor graders

New big tools for haulage road maintenance are now available with the announcement of a new series of motor graders. Four units are offered, using from 83 to 160 hp. diesel engines. Design features have been developed as a result of extensive field testing by the manufacturer.

These include a box-section, single-member frame, a hydraulically controlled saddle for close control of blade action from the cab, hydraulic steering, high axle clearance and heavy-duty transmissions. All models have six speeds forward and reverse with creeper speeds available as optional equipment.

Contour of the blade has been designed to give a superior cutting and rolling action of the material being peeled off the road surface. The blade itself is 3 ft. high and 9 ft. long and is remote-controlled. Optional equipment can be ordered which greatly improves the usefulness of the new grader, including a scarifier attachment, snow plow and wing, right or left moldboard extensions and an elevating grader attachment. (Huber-Warco Co., Marion, Ohio.)

Enter 210 on Reader Card

Stacker attachment

The capacity of storage piles can be increased immeasurably with the addition of an attachment to the discharge end of a stacking belt conveyor. The new unit is a compact thrower unit suspended from the frame of the stacker. A swivel joint permits the unit to swing in a 270 deg. arc to build storage areas far beyond the normal reach of the stacking belt alone. This not only increases the capacity of the storage area, but lets the one conveyor put a variety of different sizes into segregated storage.

Trajectory of the material can be raised or lowered within a range of 8 to 40 deg. above the horizontal, in addition to the horizontal movement. Two sizes are available, 10-in. and 16-in. widths. (Stephens-Adamson Mfg. Co., Ridgeway Ave., Aurora, Ill.)

Enter 211 on Reader Card

Vacuum cleaning system

This newly developed vacuum cleaning system is available to remove hot or abrasive dusts from storage bins or from materials handling systems. A single operator can quickly and effectively remove cement, lime, silica, rock dust or sand from elevator boots, storage bins, box cars or covered-top gondolas, according to the manufacturer.

The portable equipment itself can be moved from one location to the other by one man. Alternatively, it can be truck mounted or made permanent. A 4-in. suction nozzle is the only equipment handled by the man. It is a simple operation for him to insert it into the space to be cleaned. The accumulated material is pumped into a dust bin or truck body for disposal. (Ripco Air Systems, Inc., 251 So. Third St., Oxford, Pa.)

Enter 212 on Reader Card

Air compressor

Rock products producers in out-of-the-way places often wish for a reliable source of compressed air to operate a single pneumatic instrument or air tool. A manufacturer has apparently met this need by offering a lightweight, portable compressor. Weighing only 18 lb. with a ⅛ hp. electric motor ready to be plugged into a 115-v. circuit, the unit can supply nearly 250 cu. in. a minute of oil-free compressed air at 20 psi. to operate pneumatic instruments. Smaller volumes of air are available up to 100 psi. (Winslow Mfg. Corp., 3695 E. 10th Court, Hialeah, Fla.)

Enter 213 on Reader Card

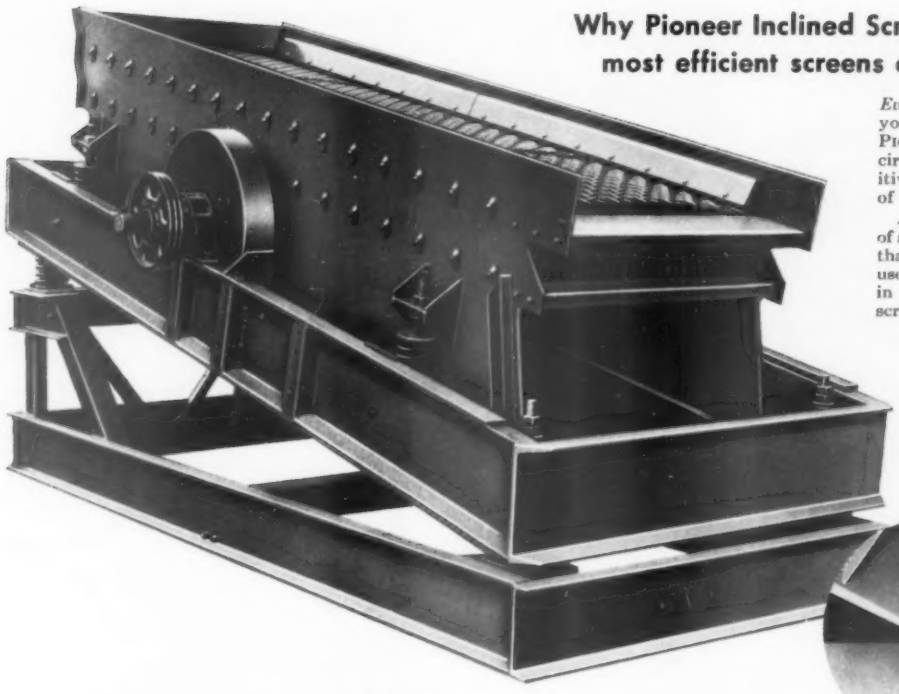
Quick-dry paint

Rock products producers with painting problems will welcome the announcement of a rust-resistant paint that will air dry in 30 min. This maker's primers and glossy colors can be applied to wood or metal surfaces by spray, brush or dipping. Colors available in the new formulation should suit almost every producer's fancy—chrome, green, red, two shades of gray, yellow, a high-intensity "safety" yellow and black. Containers to suit almost every job are available, from ½ pint for the touch-up artist to 55-gal. drums for the most ambitious maintenance man. (Rust-Oleum Corp., 2799 Oakton St., Evanston, Ill.)

Enter 214 on Reader Card

Please turn to page 166

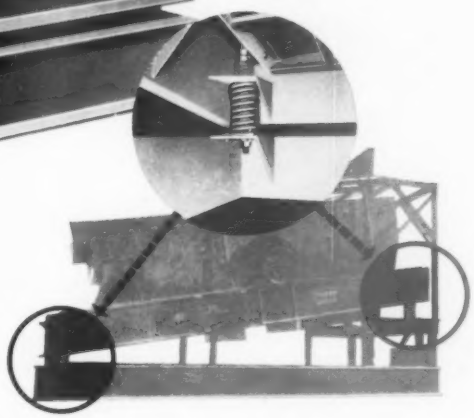
Why Pioneer Inclined Screens are among the most efficient screens on the market today



Every inch of this Screen works for you. No matter what the load, PIONEER's perfectly balanced full-circle throw provides the same positive *downhill* agitation at each end of the screen as in the middle.

Also . . . the easy downhill slope of a PIONEER Inclined Screen means that all the energy is effectively used for screening . . . not used up in conveying material across the screen cloth.

Note how Pioneer secondary spring suspension actually floats screen frame to keep vibration in the screen and protect supporting structure.



What's different about these new-type Vibrating Screens?

Answer: *Virtually no vibration transmitted to the supporting structure.*

PIONEER'S new and exclusive system of dual spring suspension keeps vibration in the pan . . . *where it belongs! The supporting structure doesn't have to fight back.*

This is important, for no matter how perfectly any screen may be balanced when it leaves the factory, many things can happen later to destroy that balance. Uneven loads, clogged screens, worn bumpers, or a less-than perfect installation will disturb the balance and, in the case of conventionally mounted screens, this will set up undesirable vibrations in the supporting structure.

PIONEER engineers solved this problem by floating the screen frame on heavy coiled springs as shown in illustration at the right, above. Whether installed on bin, floor, sill or suspension mounting, these springs have 3 big advantages:

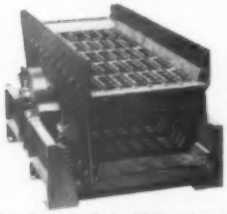
1. Springs absorb any induced vibration and prevent its transfer.
2. Motion of screen pan is improved to give even better screening efficiency. Heavier loads and higher capacities are more easily handled.
3. Strain on screen assemblies and frame is reduced, therefore less maintenance is required. Screen cloth and punched plates last longer.

For more information on PIONEER Vibrating Screens, see your nearest PIONEER Distributor.

Free Handbook

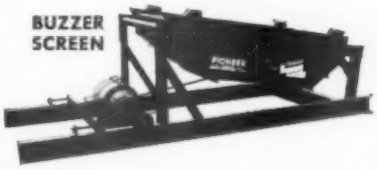
For your free copy of *Facts And Figures* (the most complete and comprehensive handbook for the aggregates-producing industry), write to PIONEER ENGINEERING, Minneapolis 14, Minnesota, or contact your Pioneer Distributor.

Other Inclined Vibrating Screens by Pioneer



MESABI SCREEN

This heavy-duty Vibrating Screen is built with brute strength to take harsh abuse. Frame is 18" car channel on I-beams reinforced with 8"-wide flange beams. Pans are ¾" or ½" thick. Four-bearing, heavy-duty shaft and other parts are correspondingly strong. Sizes from 4' x 10' to 6' x 14'.



BUZZER SCREEN

This small, compact Vibrating Screen fits on PIONEER Portable Conveyor. (With Mechanical Feeder at other end, this makes an efficient low-cost gravel plant.) Also available with bin mounting. 3' x 6' size produces up to 50 tph of ¾" material; 4' x 8' produces up to 90 tph of ¾" material.

Pioneer®
ENGINEERING
DIVISION OF POOR & COMPANY, INC.

Enter 1292 on Reader Card

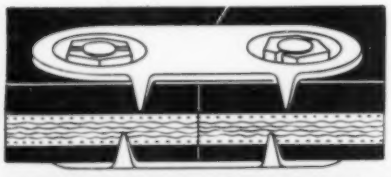


FIG. 1

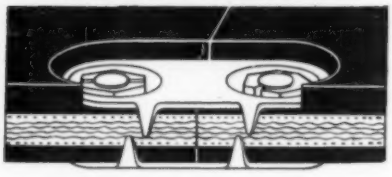


FIG. 2

Countersink tools

Belt fasteners can be more secure and the joint made stronger if they are countersunk in the rubber carcass of the belt. A manufacturer of conveyor belt fasteners has made it possible to make clean, accurate countersinks by developing a set of two countersinking tools.

One unit makes the vertical cut exactly the correct size for the fastener link. The other tool makes a horizontal slice to remove just the right amount of rubber cover to expose the carcass fabric. Then the teeth of the top fastener sink deeply into the body fabric, making a tight, strong splice.

This method of splicing belts often makes it possible to use the next size smaller fastener. At the same time flexing at the joint is reduced prolonging the life of the splice. Countersinking has other advantages. There is no splice interference with return idlers; belt scrapers, skirt boards and belt wipers will last longer. (Flexible Steel Lacing Co., 4607 Lexington St., Chicago 44, Ill.)

Enter 215 on Reader Card

Roller chains

A new series of precision steel roller chains has been designed to operate on ASA roller chain sprockets. However, it is made with offset sidebars. The maker states that it is tough enough to be used on the same heavy-duty drives that the parallel sidebar roller chains have been used for. However, the offset sidebars are all identical, and replacement links can easily be inserted at any time. The new chains are available in 1¼ through 2¼ in. pitch, in single and double widths. (Atlas Chain & Mfg. Co., West Pittston, Pa.)

Enter 216 on Reader Card

Tractor attachment

The usefulness of this manufacturer's line industrial tractors can be vastly extended with a low-cost grader attachment. This attachment styled Lev-L-All can apparently match the performance of any single-purpose 50-hp. tandem motor grader and at much lower cost.

The attachment's planing ability and front end stability matches these features found only in more costly units. Turning radius is only 28 ft., and the unit is highly maneuverable. Standard equipment includes hydraulically operated leaning front wheels and lateral blade shift. (Massey-Ferguson Industrial Div., Wichita, Kans.)

Enter 217 on Reader Card

Bit holder

Quarry operators will find this new bit holder to be a useful tool for maintaining drill bits in first class condition. The fixture holds the drill bit in a rigid but easily controlled position in relation to a grinding wheel. The bit holder is calibrated in degrees to eliminate any guesswork in setting up the bit for resharpening. The entire bit holder assembly can be raised or lowered with a calibrated handwheel which can be locked into position.

The grinding wheel is held securely in an adjustable, pivoted holder. Travel of the wheel is manually controlled through a machined travel slot which is locked into position. The grinding wheel can be operated by either air or electric motor. The assembly can be quickly disassembled into small compact parts and can be reassembled easily for field or shop service. (Drillers Service, Inc., 1794 Highland Ave. N.E., Hickory, N.C.)

Enter 218 on Reader Card

Tractor shovel

Rubber-tired tractor shovels are getting bigger and bigger. Largest unit in this manufacturers line is Model PM-440 rated at 11,000 lb. carry capacity and 21,000 lb. lifting. Depending on the density of the material to be handled, buckets can be furnished from 3 to 4¼ cu. yd. heaped capacity.

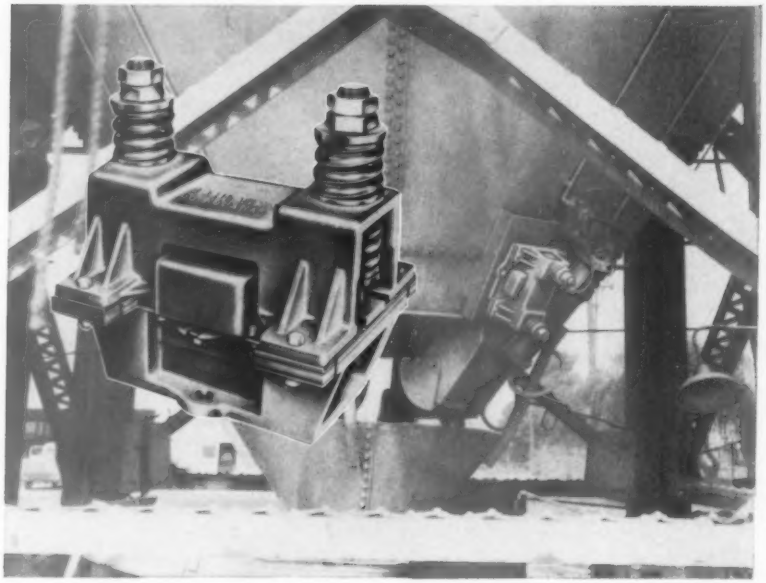
Standard equipment on the new heavy-duty tractor shovels includes power-shift transmission, planetary axles, torque converter and 4-wheel drive. Two diesel engines are offered, either 152 hp. or 175 hp. (Pettibone Mulliken Corp., 4700 Division St., Chicago 51, Ill.)

Enter 219 on Reader Card

Please turn to page 168

SYNTRON cost-cutting equipment of proven dependable Quality

keep bins and hoppers free-flowing



SYNTRON

Pulsating Magnet

BIN VIBRATORS

. . . prevent arching and plugging of sand, aggregate, gravel and heavy stone in bins, hoppers and chutes—keep these materials flowing freely to process equipment.

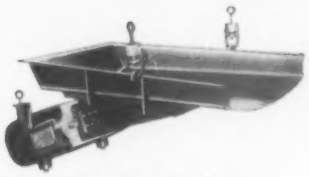
Simplicity of design assures dependability of operation and low maintenance. They are electromagnetic units that produce 3600 powerful, instantly controllable vibrations per minute. Enough vibration to move the most stubborn material.

SYNTRON Bin Vibrators provide the most efficient and effective method of keeping bulk materials free flowing. Eliminate equipment damage by hazardous pounding and rodding.

SYNTRON Bin Vibrators are available in a wide range of sizes. They are easy to install, easy to operate and easy to maintain. Eliminate production slow-downs caused by sticking and clogged bins.

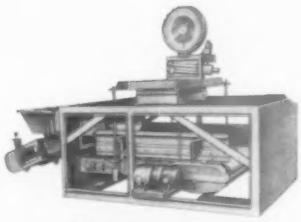
. . . write for complete informative literature today

Other SYNTRON Equipment of proven dependable Quality



VIBRATORY FEEDERS

VIBRATING SCREENS



GRAVIMETRIC FEEDERS

ROTARY VIBRATOR CAR SHAKERS

TEST SIEVE SHAKERS

SYNTRON COMPANY

450 Lexington Ave. *Quality Equipment Since 1921* Homer City, Penna.

Sales Offices in principal cities in the United States and Canada—Agents in most foreign countries

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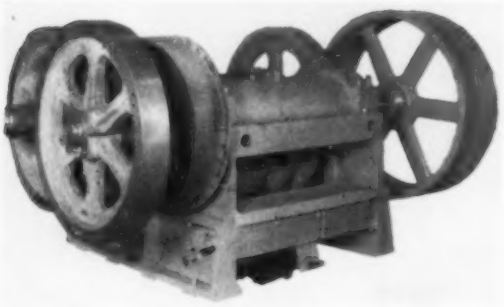
continued from page 166



Jaw crusher

Exceptional capacity for a jaw crusher is possible with the unusual design of a new crusher. The two jaws move together in a synchronized inward and downward movement. This, the maker claims, together with longer jaws, produces better nip on the incoming material. A large volume of sized material is discharged rapidly and cleanly from the crusher.

Two popular sizes are available—13 x 36 in. with a jaw opening range between ⅞ and 4 in., and an 18 x 36-in. unit with jaw openings between 1½ and 5 in. Reversible crusher jaws are made of manganese steel. (Universal Engineering Corp., 625 C Ave. N.W., Cedar Rapids, Iowa.)

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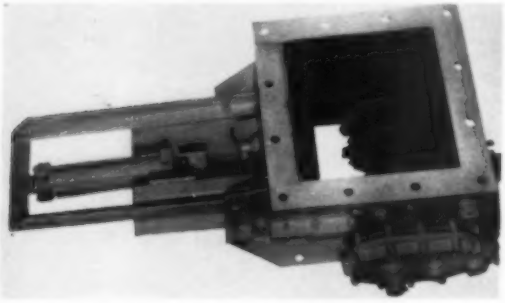
Feeder-gate



A newly-developed gate with an integral feeder improves the flow of materials out of storage bins or hoppers. It is offered for handling cement, lime, fly-ash and other fine materials which normally present flow problems when put through narrow openings.

Basic unit is a 9-in. or 14-in. air-operated slide gate. The air cylinder permits the gate to be held in a predetermined partially open position. The size of the opening can be set to match the tendency of the material to flush or the actual volume of material to be fed.

Feeding device is a section of 6-in. diam. screw conveyor with notched flights. This is operated by a variable speed air motor through a shaft-mounted reducer. The rotating helix controls the rate of flow of material through the gate and, at the same time, tends to break up lumps and to aerate the material. (The Fairfield Engineering Co., 324 Barnhart St., Marion, Ohio.)

Enter 221 on Reader Card

Carrier-mounted crane line

Eight models make up a new line of carrier-mounted cranes which are offered to do a wide range of jobs. Smallest unit is rated at 8½ tons with the largest at 25 tons—a 1 cu. yd. unit. The maker states that these units have been realistically rated, with actual tests far exceeding the ratings.

Each model includes full-vision cab, underfloor mounting for controls, more accessible machinery with frames, engines, clutches and bolted-on counter-weights matched to the capacity of the machine. (Quick-Way Truck Shovel Co., P.O. Box 1800, Denver, Colo.)

Enter 222 on Reader Card

Power package

A newly designed wheel prime mover offers the high speed of a truck with the high torque, low-speed power of a tractor. It is available with 2 or 4-wheel drive to give speeds ranging from controlled creep at full throttle up to road speed of 35 mph.

The "Commando" is the basic unit for a complete line of front end and rear-mounted attachments. As a crane the unit has 7,000 lb. lifting capacity; as a backhoe, it can apply 7,000 lb. digging power to make a 12½-ft. deep trench. First tools to be offered with the new prime mover are designed for a number of construction jobs not large enough to justify the use of special-purpose machines. (Ottawa Steel Div., Ottawa, Kan.)

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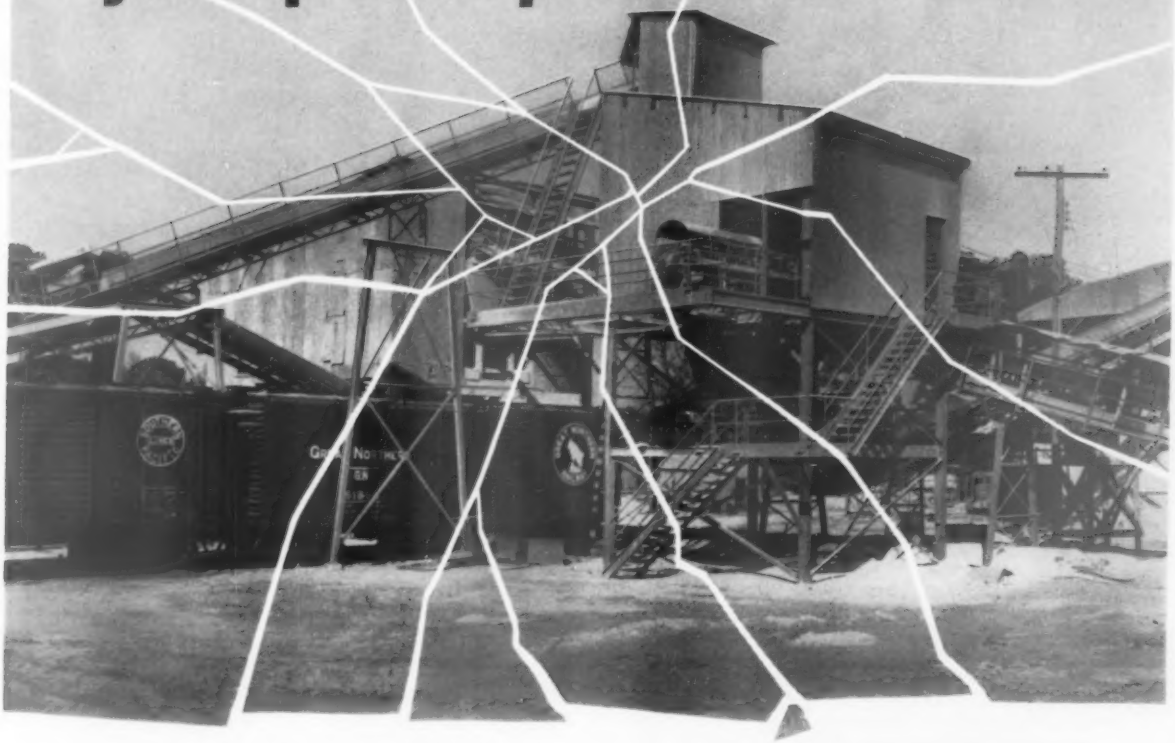
END

don't let downtime SMASH your profit picture in '60



GET SET WITH SECO SCREENS

Are you *really* set for '60 peak production and profits? . . . or will downtime from screen failure take the cream of the profits right out of your pocket. Don't let this happen to your plant! Get time-conscious SECO screens on your job . . . they're engineered and built to stand the gaff under peak load conditions . . . year after year . . . on the toughest screening jobs.

CHECK YOUR SCREENS RIGHT NOW! There's still time to replace with SECO . . . the best *profit-insurance* you can put in your plant.

SECO builds over 450 models in 4-bearing and Twin Bearing screens, to give you fast, accurate, trouble-free screening of any material from coarse stone to ag-lime.

Send for SECO 4-BEARING CATALOG #204 and/or SECO TWIN BEARING BOOKLET TB-21

SCREEN EQUIPMENT CO., INC.
Buffalo 25, N.Y.

SECO

"TIME CONSCIOUS" VIBRATING SCREENS

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MANUFACTURERS NEWS

Buell Engineering Co. purchases Northern Blower Co.

THE 49-YEAR-OLD Northern Blower Co., Cleveland, Ohio, has been acquired by Buell Engineering Co., Inc. L. A. Eiben will operate Northern Blower Div. of Buell as vice president within the parent company.

J. A. McBride (left), president of Buell Engineering, is shown above with Mr. Eiben after signing the agreement.

Case reveals '60 products, plans

MORE THAN 150 editors and financial analysts heard Marc B. Rojtman, president of J. I. Case Co., announce a line of new industrial products for 1960 and the company's plans for the next few years.

Included among the new products shown at the Miami Beach meeting were a diesel engine, 4-wheel drive front-end loader and a 6½-cu. yd. self-loading scraper—first unit in a line of general-purpose construction equipment.

The company has already invested more than $28 million in research and product development, according to Mr. Rojtman. In the next few years, the firm expects to offer a line of off-highway haulage trucks and several basic production tools for the rock products industry.

Koehring names western manager

PAUL A. MCDONALD has been appointed district manager for the states of California, Nevada, Utah and Arizona by the Koehring Div. of Koehring Co., Milwaukee, Wis. Mr. McDonald studied at Case Institute and the University of Southern California. He has had many years of experience in the engineering, construction and equipment application fields.

LeTourneau promotes Fain

STAN FAIN has been appointed manager of advertising and sales promotion for R. G. LeTourneau, Inc. of Longview, Texas. Mr. Fain joined the firm three years ago as advertising supervisor, later becoming assistant advertising manager. In the new post, he will head the LeTourneau advertising and sales promotion department and will direct marketing activities.

Yale names area general managers

FRANCIS O. BOUFFORD, former western regional sales manager for Yale Materials Handling Div., Yale and Towne Mfg. Co., has been appointed New York branch sales manager. At the same time, Louis W. Jander, formerly assistant general sales manager, has been promoted to general sales manager of the division. Mr. Jander will be responsible for domestic and Canadian sales.

U. S. Gypsum tops past safety records

U. S. GYPSUM CO. established the best safety record in the company's history during 1959. Achieved was a 1.8 lost-time frequency rating as measured by American Standards Association. Of 59 plants, 34 had perfect records. This was a 30 percent improvement over the 1958 record.

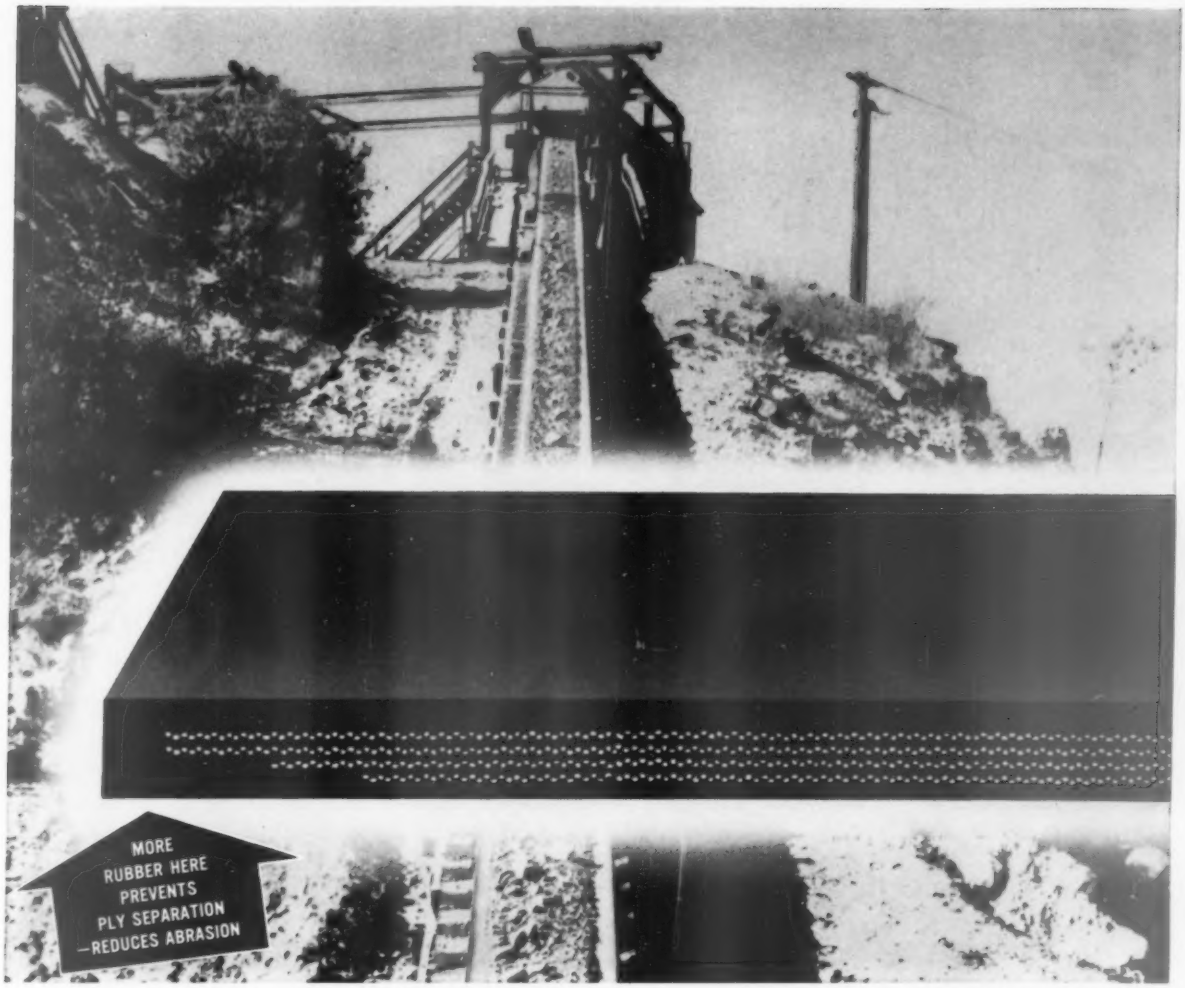
Hardinge to invest in foundry expansion

HARDINGE CO. INC., York, Pa., will spend $300,000 to expand and modernize its foundry facilities, to offer its customers better service on castings and "jobbing" work. The enlarged foundry will include about 32,000 sq. ft. of floor area, and feature advanced sand mixing apparatus, cranes and other materials handling equipment.

Link-Belt names assistant sales head

REX A. SMITH has been appointed assistant sales manager by Link-Belt Speeder Corp. He will serve jointly with Dave Van de Roovaart, dividing responsibilities geographically, with Mr. Smith handling the western U.S., Canada and northern Mexico.

(Continued on page 172)



EXCLUSIVE "COLEDGE"* CONSTRUCTION

gives Quaker Thermoid Conveyor Belting extra life where it counts

Unique "Coledge" construction puts more rubber *at the edges* where it's needed, prevents ply separation, makes a more flexible and wear resistant edge where abrasion is greatest. Punishment at the edges—especially the tough use dealt out in quarrying—can kill most conveyor belting in a fraction of the lifetime of Thermoid-Quaker belting.

Tests show Thermoid-Quaker "Coledge" construction lasts and lasts on the same jobs where other belting fails. "Coledge" construction is available on all grades of Thermoid-Quaker belting.

What's more, all Thermoid-Quaker conveyor belting is prestressed in manufacture, so that the belt is actually in compression when you get it—ready for the heaviest load without strain.

Examine Thermoid-Quaker Belting with the exclusive "Coledge" construction at your Thermoid distributor's, or write for further information to Thermoid Division, H. K. Porter Company, Inc., Tacony & Comly Streets, Philadelphia 24, Pa.

*Patent Applied For

THERMOID DIVISION PORTER H.K. PORTER COMPANY, INC.

PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION, PEERLESS ELECTRIC DIVISION; Specialty Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION, H. K. PORTER COMPANY de MEXICO, S.A.; and in Canada, Refractories, "Disston" Tools, "Federal" Wires and Cables, "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD.

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(Continued from page 170)

Barber-Greene creates new sales posts

BARBER-GREENE CO., Aurora, Ill., is reorganizing its field sales management set-up. The move parallels recent increases in the scope of product sales administration under division sales managers and product section managers. The field program will increase the number of resident district sales managers, supervised by newly-appointed eastern and western regional sales managers. A field sales manager is also appointed. Among the new appointees are Ralph Dano, regional sales manager for western division; Kent Shell, regional sales manager for eastern division; field sales manager Tom Benbow. All three will be headquartered in Aurora, Ill.

Eaton subsidiaries become divisions

EASTON MFG. CO. announced that its wholly owned subsidiary, Cleveland Worm and Gear Co. and the latter's subsidiary, Farval Corp., have become divisions of the parent company. George H. Acker, president of Cleveland Worm and Gear and Farval, has been appointed general manager of the two divisions with full administrative responsibilities. Mr. Acker joined the engineering department of Cleveland Worm and Gear in 1923. He was elected vice president in charge of engineering and production in 1942 and, ten years later, executive vice president of the company and its subsidiary. He was named president in 1957.

Esco names Davis executive v.p.

JEFFERSON J. DAVIS, formerly vice president in charge of product divisions at Electric Steel Foundry, has been named executive vice president. Mr. Davis has been with the firm for nearly 24 years. In 1954 he was promoted from equipment division manager to vice president in charge of product divisions. He is a Washington State College graduate.

TRW Products opens Houston office

THOMPSON-RAMO-WOOLDRIDGE Products Co. has opened a sales engineering office in Houston, Tex. Rigdon Currie, southwestern regional sales manager, heads the new office which covers activities in Texas, Oklahoma, Arkansas, Louisiana and New Mexico. Mr. Currie received his M.B.A. at the Harvard Graduate School of Business Administration. Prior to joining the firm, he was a sales engineer for Spotswood Parker and Co., Atlanta, Ga. He joined TRW Products at its founding in 1958.

(Continued on page 174)

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LORAIN ALL THE WAY—MOTO-LOADER AND LORAIN-26 SHOVEL BOOST STONE OUTPUT

At French Lick, Indiana, a heavy-duty ¾-yard Lorain-26 shovel and a 1¾-yard Moto-Loader Model ML-153 can each handle as much as 100 yards of shot rock an hour.

Wm. Cave Stone Company uses its rugged Lorain-26 to work along a 20 to 50 foot face. Here's where Lorain's heavy-duty design and cycle speed pay off. Power plant, clutch and hoist shafts are positioned to contribute to a counterweight effect. This husky construction without excess weight, plus easy-to-operate controls make the "26" a high production machine.

Teammate in this operation is the mobile ML-153 Moto-Loader. Besides supplementing the Lorain-26 at the quarry face filling trucks with shot rock, this versatile loader fills bins at the crushing plant . . . stockpiles crushed limestone . . . loads out six sizes of crushed stone into trucks.

Scampering around an 11-acre area calls for Moto-Loader maneuverability. With Lorain's exclusive one-foot-travel control, the operator maneuvers forward or backward as fast or slow as he wants . . . uses his hands for other operations. Balanced weight distribution lets the Moto-Loader carry more without bounce or jiggle.

It all adds up to faster handling all along the line . . . keeps trucks on the move. For details, see your Lorain distributor.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

LORAIN®
ON THE MOVE

PLANTS in Lorain, Elyria and Bucyrus, Ohio.

PRODUCTS—Power shovels, cranes, draglines, clamshells, and hoes on crawler mountings from ⅜- to 2½-yard capacity · Cranes from 7 to 80 tons . . . on crawlers, and as rubber-tire Moto-Cranes, and Self-Propelled Cranes · Rubber tire front-end Moto-Loaders in 1¾- and 2-yard models.

OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.

MANUFACTURERS NEWS

(Continued from page 172)

American Air Filter announces sales switch

RUSSELL C. TAYLOR has been named Pacific regional manager for American Air Filter Co., Inc., in the San Francisco office. At the same time, Charles J. Bressoud has been appointed manager of the Los Angeles branch office, succeeding Mr. Taylor.

Mr. Taylor succeeds Richard H. Nelson, vice president, who will continue as a director of the company.

Caterpillar to open Belgian plant

CATERPILLAR TRACTOR CO. has announced plans to open an emergency parts plant in Brussels, Belgium, sometime in the second quarter of 1960. The new plant is to be called "Caterpillar Overseas C A," designed to serve customers in Europe, the Middle East and Africa. Warren Taylor, Brussels representative for the company, will head the new plant.

END

BONDED QUALITY BARGAINS

CURRENT MODELS - IMMEDIATE SHIPMENT FROM OUR FACTORY - WRITE, WIRE OR PHONE FOR FREE CATALOG AND PRICES

BONDED® TROUGHING IDLER CONVEYOR BARGAINS

CONVEYOR PRICES INCLUDE BELTING

Complete Pre-Fab sections of 8" Jones & Laughlin Jr. I Beam Frame Conveyors quickly and easily joined together on the job. These beams are rolled with .20% Copper Content. Atmospheric exposure tests disclose that Junior Beams, with .20% Copper have as much as four times the resistance to corrosion as non-copper steels. Braced with structural angle, welded to frame for maximum rigidity. Equipped with 5" roll diameter idlers and return rolls, 20" diameter head pulley and 16" diameter tail pulley, mounted on 2¼" or 2⅞" diameter shaft.

We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply, 28 oz. duck, ¼" top rubber cover x 1/16" bottom cover Major grade belt and is Fresh Stock made by leading manufacturers. **WRITE FOR BULLETIN #1138.**

Bonded troughing idler conveyors also available in Truss Frame Construction. **WRITE FOR BULLETIN #1189 AND PRICES.**

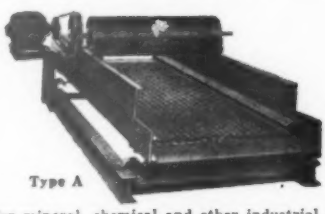
Belt Width	Length of Conveyor	List Price	Sale Price	Add or Deduct Per Ft.
14"	25'	$1425	$ 753	
14"	60'	2266	1182	$17.18
14"	85'	3445	1783	
16"	20'	1287	680	
16"	45'	2180	1140	
16"	60'	2715	1416	$18.40
16"	90'	3786	1969	
18"	25'	1507	813	
18"	45'	2261	1206	
18"	70'	3205	1696	$19.62
18"	85'	3771	1991	
18"	100'	4337	2285	
18"	130'	5469	2873	
20"	25'	1547	852	
20"	60'	2940	1579	
20"	75'	3536	1891	$20.78
20"	90'	4133	2202	
24"	25'	1622	916	
24"	45'	2479	1361	
24"	70'	3550	1916	$22.22
24"	100'	4835	2583	
24"	120'	5692	3026	
24"	150'	6977	3693	
30"	50'	2969	1649	
30"	70'	3948	2154	$25.25
30"	90'	4928	2659	
36"	25'	1854	1140	
36"	45'	2915	1711	$28.51
36"	60'	3711	2138	
36"	100'	5832	3278	

BONDED® HEAVY DUTY MOBILE CONVEYORS

- FAST ECONOMICAL HANDLING OF BULK MATERIAL
- AVAILABLE WITH SCREEN AND FEEDER
- RUGGED 30" DEEP TRUSS FRAME
- HIGH TONNAGE AT LOW COST
- EQUIPPED WITH TOW HITCH

The economical solution to the need for a heavy duty conveyor that can be readily moved from one job-site to another. Available with mast or mastless type undercarriage and hydraulic powered mechanism. All standard conveyor accessories can be used. Lengths to 60 feet and belt widths through 30 inches. **Priced from $2365.00**

BONDED® GENERAL DUTY AND HEAVY DUTY VIBRATING SCREENS



Type A

Type B

For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals, including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry.

PERFECT BALANCE AND SHARP ACTION. Eccentric weight mechanism, spring mounted. 1 to 3 decks, 2' x 4' to 3' x 8'. **WRITE FOR "SEVEN SECRETS OF SUCCESSFUL SCREENING" IN BULLETIN NO. 1086.**

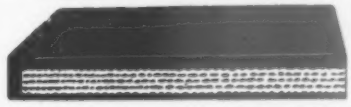
PRICED FROM $443

FACTORY BALANCED, CONTROLLED VIBRATION. Four bearing positive throw eccentric shaft: 3' x 6' to 5' x 14'. 1 to 5 decks. **WRITE FOR BULLETIN NO. 1087 AND 9 REASONS WHY BONDED IS YOUR BEST**

PRICED FROM $1620.

TESTED CONVEYOR BELTING*

We pay freight on 200 pounds or over plus an additional 10% savings from sale price for full rolls 500 to 650 feet.



Major Brand: 12# to 15# Average Friction Pull. 800# to 1000# Average Cover Tensile.

Heavy Duty 4-ply, 28-oz. duck, 1/16" top rubber cover x 1/16" bottom rubber cover belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stocks.

Width	Ply	List Price	Sale Price
14"	4	$3.78 ft.	$2.94 ft.
16"	4	4.24 ft.	3.09 ft.
18"	4	4.69 ft.	3.42 ft.
20"	4	5.17 ft.	3.95 ft.
24"	4	6.08 ft.	4.43 ft.
30"	4	7.47 ft.	5.42 ft.
36"	4	8.85 ft.	6.43 ft.

Major Bee Brand: 16# to 19# Average Friction Pull, 2400# to 3000# Average Cover Tensile. Skim coat between plies.

A high grade of heavy duty 4 and 5-ply, 28 oz. duck, 1/16" top rubber cover x 1/16" bottom rubber cover. These belts are for more severe service, high tonnages and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal, and other similar materials, both wet and dry. Belts have molded rubber edges.

Width	Ply	List Price	Sale Price
14"	4	$4.48 ft.	$3.18 ft.
16"	4	5.04 ft.	3.60 ft.
18"	4	5.61 ft.	3.98 ft.
20"	4	6.14 ft.	4.54 ft.
24"	4	7.22 ft.	5.14 ft.
30"	4	8.87 ft.	6.31 ft.
36"	4	10.49 ft.	7.64 ft.
24"	5	8.47 ft.	6.01 ft.

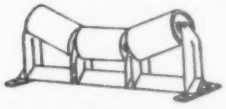
***All belting is tested by the Engineering laboratory of one of the largest universities in the United States. It is guaranteed to meet or exceed listed specifications.**

Other widths, plies, duck weights and cover thickness available at low prices.

WRITE FOR FREE SAMPLE & BULL. #1263

BONDED® IDLERS AND RETURN ROLLS

SAVE 25% AND MORE



3-roll, 5" diameter Troughing Idlers for:			
14" belt	$19.75	24" belt	$22.75
16" belt	20.50	30" belt	23.85
18" belt	21.90	36" belt	24.90
20" belt	22.10	48" belt	27.50

1-roll, 5" diameter Return Rolls for:			
14" belt	$ 8.50	24" belt	$11.00
16" belt	9.00	30" belt	12.50
18" belt	9.50	36" belt	13.75
20" belt	10.00	48" belt	16.50

All steel. Interchangeable with other well-known makes. Furnished with replaceable prelubricated sealed ball bearings. Maintenance is negligible. **WRITE FOR BULLETIN #1138.**

BONDED SCALE AND MACHINE COMPANY

PHONE Days: Hickory 4-2186 — **WRITE FOR FREE CATALOG AND PRICES** — **PHONE Evenings: AX. 1-2213 or TEmple 7-4519**

128 Bellevue — **Mfrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders** — **COLUMBUS 7, OHIO**

SPRING BUYS

AGGREGATE EQUIPMENT

42" CONVEYOR SYSTEM

CONVEYORS
1—14" x 100' Belt, steel frame, Exc.
1—18" x 178' Belt, steel frame, 7½ HP.
3—6" x 43' Carpco, BC-68, sliding belt.
2—6" x 33' Carpco, BC-68, sliding belt.
1—60" x 150', steel framework, 100 HP. gearmotor
1—42" x 1250', Link Belt, 2—100 HP. gearmotors
1—42" x 625' Link Belt, 200 HP. motor 440 V Complete with stacking tower
1—36" x 645' Link Belt, 100 HP. gearmotor
1—42" x 870' Link Belt Trailing Type and Conveyco mobile stacker, 100 HP. gearmotor 440 V.

CRUSHER, JAW
1—10 x 20 Pacific w/25 HP. & Starter
1—10" x 24" (Size 50) Kue-Ken, 25 HP. 440 V
1—36" x 42" Birdsboro-Buchanan, 100 HP. 440 V.
1—2½" x 4" Braun chipmunk, 2 HP. 220/440 V
2—2¼" x 3 Braun chipmunk, ¾ HP. Motor
1—15" x 36" Universal, 50 HP. 220/440 V.

CRUSHER, GYRATORY & CONE
1—2'4" Traylor TY, Less Motor
1—4' Symons, Shorthead, 150 HP. motor
2—5½' Symons, standard, 200 HP. motor

CRUSHING PLANTS
1—10" x 36" Pioneer Model 40 V, UD 24 Diesel Power.
1—15" x 24" Cedar Rapids Portable, Case Gas Power
1—10" x 16" Cedar Rapids Pitmaster, Complete UD 14 Diesel

DRYER
1—36" x 13' Hardinge Ruggles Cole Complete excellent. Located Clearwater, South Carolina

FEEDERS
1—36" x 8'4" Link Belt, Apron, 3 HP. motor
1—20" x 6' Schaffer Poidometer Constant weight
1—10" x 44" Schaffer Poidometer Constant weight
1—36" x 72" Jeffrey Traylor Grizzly Feeder, 440 V.

HOPPER
Conveyco truck dump station, Hopper 15' x 15' x 10' with tilting Grizzly, 4' x 8' plate feeder, all complete with Hydraulic cylinders, gearmotor drives.

KILN
1—48" x 30' Hardinge Ruggles Cole, Complete Excellent. Located Clearwater, South Carolina

MILLS, BALL & ROD
1—4' x 10' Marcy Rod Mill, 75 HP. 440 V.
1—3' x 8' Hendy Rod Mill, 30 HP. 440 V.
1—5' x 10' Marcy Ball Mill, 100 HP. 440 V.
5—8' x 9' Traylor Ball Mills, 250 HP. 2300 V.
1—5' x 8' Traylor Rod Mill, 150 HP. 440 V.
3—5' x 14' Marcy Ball Mill, 100 HP. 2200 V.

SEPARATORS
1—Type D-1A Exolon, 3 unit Vertical Roll Type
6—Type MI-418 Carpco High intensity
2—Type HT-460 Carpco, High Tension
2—Model BXM-100 Sutton Steele & Steele, size 36" x 54", 10 Hp. Fan., 220/440 V.
1—Model BXM-200 Sutton Steele & Steele, 10 HP. Fan.

SCREEN
1—9' dia. x 54½' Yuba Trommel, 100 HP. West. 440 V.
4—4' x 12' Tyler Ty-Rock, F-600, 10 HP. 220/440 V.
1—4' x 8' Symons Rod Deck Screen, 7½ HP. 220/440 V.
1—4' x 8' Tyler Hummer, Type 38
2—6' x 12' Allis Chalmers lowhead, 10 HP. 220/440 V.
6—4' x 5' Tyler "Hummer", type 50 Head

SHOVELS
1—Model 111 M Marion shovel & Dragline, Diesel Electric 4 yd., 100' Dragline Boom
1—Model 170 B Bucyrus Erie Electric shovel Essco Bucket, 2400/4160 Y, Rotoclone Air Filter system, Complete with rubber cable, and Junction Box.

WEIGHTOMETER
1—36" Merrick Model E with Electric Recorder
1—12" Merrick Type S. Excellent Condition
1—24" Merrick Model E.
1—14" Fairbanks Morse Conveyor Scale, Exc.

WHEELS, DEWATERING
4—12'—6" x 4' Conveyco Sand Wheels, Complete with Tank, w/20 HP. West. gearmotors, Exc.

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2—Link Belt Roto Louvre Dryers, 6'4" x 24'
1—Rennenberg 6' x 50', ⅜" shell.
1—Ruggles Cole 5' x 30', ⅜" shell.
1—Allis Chalmers 4' x 40'.
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GYRATORY: Al-Chal 6, 7½, 8, 9, 10, 12, 18, 18, 20" Telsmith TY 4', 3' Gyrosphere
25B Kennedy Van Saun 12, 37½, 38, 49½"
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HAMMERMILL: Jeffrey Type B3 24x20, Type B 36x24, 36x36, 36x42, Eagle 24x24, Stedman 34x20, 36", 42". Cedar-Rapids 50-50, 30x33, 30x42.
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Eagle 36"x20' Dbl. Log Washer, Running Gear
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5'x45' Standard Rotary Dryer
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1—6", 10", 15", 20" McCully Superior Gyratory Crushers.
No. 3 up to No. 12 Gyratory Crushers.

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MILLS: Raymond 5047, 5057 Roll. Dixie 2424, 3630, 3650, CR2033 & 4033 Hammer
WASHERS: Yuba 7x35, Eagle 7x20. Hardinge 4x8.
SHOVELS: NW60, 80D, 6. Link Belt LS50, B5, LS80, Unit 1020, Manitowoc 2000B, 4500, Marion 93M, 111M, 17E 492. BE 9W, Koehring 304, 605, 1005, Lima 34, 604, 1201

MID-CONTINENT EQUIPMENT CO. INC.
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1 Bucket elevator, enclosed, speed reducer V-Belts & 5 h.p., 3 ph. motor $1,500.00
1 F-33 Syntron Feeder $350.00
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Will take $4,700.00 for all five items

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2½ Yd. Manitowoc #3900 Crane-Dragline. New 1955. 100' Boom.
1½ Yd. Manitowoc #2000B Crane-Backhoe. New 1956.
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44 Ton Gen. Elec. Diesel Elec. Loco.
40/50 Ton American Diesel Loco. Crane.
25 Ton Ind. BH. Diesel Loco. Crane
25 Ton Gen. Elec. Diesel Elec. Loco.
6 Yd. Bucyrus-Erie Elec. Shovel. 1955.
90 HP Lidgerwood 2D Diesel Hoist.

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Good Condition

Two 1955 dumptrucks—one Reo and one Cook Bros. JG64 Loadking—both with 10-wheel tandem drive, 5-speed transmission, 10 yard capacity ..... $4500.00 each

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Excellent Condition. Used on one job only.

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Bucyrus-Erie 22-B, 20-B, 15-B & 51-B Lima 34 & 604. Barber Greene lower track rollers Lots of 10 pcs $35.00 ea Crane Booms-all sizes. Shovel Fronts, Backhoes, N.W. 6 & all other type machines. All New and priced 35 to 60% of list. Write or call: Air Compressor Rental Co., Inc., 19615 Nottingham Rd., Cleveland 10, Ohio.

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One Model 621 Page Walking Dragline machine presently working and in good operating condition. Available with either a 150' boom and 5 cubic yard Page AUTOMATIC Dragline Bucket or a 135' boom and 6 cubic yard Page AUTOMATIC Dragline Bucket. This machine ideal for sand and gravel work. Immediate delivery can be made and we are willing to accept any reasonable offer. An authorized factory engineer will assist in the erection of the machine and instruction of the operator. Phone POrtsmouth 7-9300, Chicago, Illinois.

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MILL TYPE MOTORS

2—450 HP 180 RPM 2300/4160 volt, replacement cost each $28,898, sale each $18,000.
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Above motors are 160% starting torque, 120% pull-in torque, 150% pull-out torque, 100% power factor. Loaded on cars, Corpus Christi, Texas

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GENUINE INGERSOL RAND ROCK BITS—save up to 80%

Types 1&2 Thread.
Side Hole & Center Hole.
Sizes 1½", 1⅝, 1¾, 1⅞, 2, 2⅛, 2¼, 2⅜, 2½.
Lots of 50 or more 20¢ each up to 2"
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Additional discount 10% on 500 or more, 20% on 1000 or more.
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KILNS: Two 8' x 124 ft.

CONVEYORS: One 36" and 42" x 736 ft., complete with all equipment and supporting structure.

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LANSDOWNE, PA.
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3—29T BUCYRUS-ERIE Wire Line Blast Hole Drills
5—42T BUCYRUS-ERIE Wire Line Blast Hole Drills
1—TRAYLOR Model TZ Gyratory Crusher
1—COVERED BARGE—suitable for exhibition work, carrying cement, a work or tool boat. Also could be used as a boat club or floating office.
2—Cast Steel 96 Tooth, 1¾" D.P., 5" Face, 54.86 P.D., Hub 6" Faced. Bored for 5½", K.S. ½ x ½. Suitable for use in a tandem drive on a conveyor.
1—INTERNATIONAL-HARVESTER MODEL L-210—1952 Dump Truck (six wheel); with reconditioned motor installed. Several ELECTRIC MOTORS ranging in size from 1 H.P. to 40 H.P.
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WEST NYACK, NEW YORK
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6—Inger Rand, 1350, 2200 & 3800'
DIESEL ELEC. LOCOMOTIVES & CRANES
4—65 ton Whitcomb 2—25 ton & 2—20 Ton
2—45 ton & 1—80 ton & 4—100 ton Gen. Elec.
25 ton Amer. Diesel Loco Crane
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30" x 36", 36 x 42 & 48 x 60 Jaw Crushers
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20" x 36" & 24" x 36" Pioneer Jaw Crusher
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9-W Bucyrus Erie Diesel Drag, 165', 12 yd.
7-W Bucyrus Erie Diesel Drag, 140', 7 yd.
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2400 Lima Elec. Drag, 130', 6 yd.
2400 Lima Diesel Drag, 130', 6 yd.
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36"x12' Stephen's Adamson Feeder
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28"x36" Traylor Blake Jaw Crusher
10"x36" Buchanan Blake Jaw Crusher
12"x24" Buchanan Blake Jaw Crusher
10"x20" Power Blake Jaw Crusher
24"x36" Farrel 14B Blake Jaw Crusher
1—48"x72" Buchanan Jaw Crusher
25"x36" Telsmith Overhead Eccentric Jaw Crusher
18"x32" Telsmith Overhead Eccentric Jaw Crusher
9"x36" Ditto.
2—28" Telsmith Inner cone Crushers
2—10"x40" Good Roads Jaw Crusher
16" Telsmith Gyratory Crusher
25" Telsmith Gyratory Crusher
13" Telsmith Gyratory Crusher
20-B" Telsmith Gyratory Crusher
HM-05-CF Pettibone Mulliken Hammermill
2—13"x30" Farrell Jaw Crushers
36"x8' feeder
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1—36" x 42" Buchanan Jaw Crusher

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Blue Ball, Pennsylvania

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25 & 45 Ton G. E. Diesel Electric Locomotives
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1—3 x 10 Seco 3 Deck Screen
2—Scoopmobile LD5 Loaders

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Buda Diesel Power Unit Mounted on heavy steel frame—14 groove sheave 14" dia. 14 V Belts—outboard bearing—Battery-Block Heater— Model 6 D.C. S. 844-D4680 B/M-Bore & Stroke 5¼x6½—Gov. 2000 RPM Price $1350.00.

St. Cloud Feed Mill
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Used Austin-Western Gyratory Crusher
Model 103 Capacity 10 to 20 tons Per Hour

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1—4¼' Symons Std. Cone Crusher complete with "V" belt pulley and coarse bowl. New March 1959. In excellent condition. Serial #40651.

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10 x 24 Jaw Crusher, roller bearing very good condition $2500.00

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FOR SALE—Cedarapids Portable Crusher w/30"x10' screen, 24" belts, 24" reciprocating feeder, pneumatic tires, air brakes, w/either 1216 twin jaw crusher or 2033 hammermill, or both, Cat. Diesel Power, sold new this spring—priced right.

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1 American Grader Cab Loader—like new
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Commercial Sand Deposit
Estimated 15 Million Tons
Location, Florida

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READY MIX CONCRETE PLANT FOR SALE

$500,000.00 ANNUAL GROSS AND STILL GROWING

LOCATED IN LAKE COUNTY, INDIANA

OWNER SEEKS RETIREMENT

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WANTED
LIME KILN

MINIMUM DIAMETER	8'0"
MINIMUM LENGTH	140'0"
MAXIMUM LENGTH	200'0"

IF KILN OF THESE GENERAL DIMENSIONS AVAILABLE WOULD LIKE TO INSPECT WHILE STILL IN OPERATION

ADDRESS ALL CORRESPONDENCE ATTENTION:

Purchasing Department

The D. M. Bare Paper Co.

Roaring Spring, Penna.

WANTED

1—Primary Jaw Crusher 25" x 40"
1—Apron Feeder 40" x 12'
1—Jaw Crusher 10" x 40"
1—Double Roll Crusher 24" x 42"
1—Screen 4 x 12 Triple Deck

This equipment must be in excellent **Guaranteed** condition. Not over **Three Years** old.

IOLA STONE & MATERIAL CO.
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WANTED
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DISTRICT SALES ENGINEER
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Prominent manufacturer of crusher and process machinery has challenging position for Sales and Service Representative with excellent opportunity for advancement. Must have minimum of 5 years heavy machinery sales experience in mining, crushed stone, sand and gravel, or cement industries. Prefer technical background in Mechanical, Metallurgical, or Mining Engineering.

Write stating age, education, experience, present employment and salary requirements. Replies strictly confidential.

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FOR AGGREGATE (CRUSHED LIMESTONE) PLANT

This is an outstanding opportunity with a new Eastern company that is expanding. Salary plus stock option for man who has
—a proven record of accomplishment in managing an aggregate plant.
—ability to produce profitable results through efficient operation.

We would prefer a college graduate but this is not a necessity. Age 30 to 55.

This is a challenging position and a big opportunity awaits the man who can get things done and produce results.

Box R-98, Rock Products, 79 W. Monroe, Chicago 3, Illinois

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We are looking for a man who is thoroughly familiar with most modern cement plant machinery and equipment to supervise program of expansion. This is an outstanding opportunity for a man who can take complete charge of all engineering and construction in connection with new and growing Eastern cement company.

Salary plus stock option.

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Box R-88, Rock Products, 79 W. Monroe, Chicago 3, Illinois

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Plant Manager—Age 47

25 years experience in all phases of crushed stone production. Specification Stone, Mineral Filler Ready Mix Concrete operations. Resume sent on request. Box R-87, Rock Products, 79 W. Monroe, Chicago 3, Illinois.

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Eastern manufacturer has an interesting opportunity for an engineer as assistant to Director of Development Engineering. Projects will consist of developing and testing new types of crushing and allied machinery. Forward resume including educational and employment backgrounds. Our staff knows of this opening. Replies confidential.

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Special report from
Henry J. Kaiser Co. and
Raymond International, Inc.

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Operating conditions:
basalt and sandstone

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In hard, abrasive ground, use the Timken carbide insert bit for greatest economy. In softer ground, use the low-cost Timken all steel multi-use bit. Both bits are interchangeable in the same thread series; you can switch bits as the ground changes. Dozens of different Timken bits fit the same drill steel. And both types are made from Timken electric furnace fine alloy steel, have special shoulder unions to protect threads against drilling impact. Let us help you select the Timken bit best suited for your job. The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits.*

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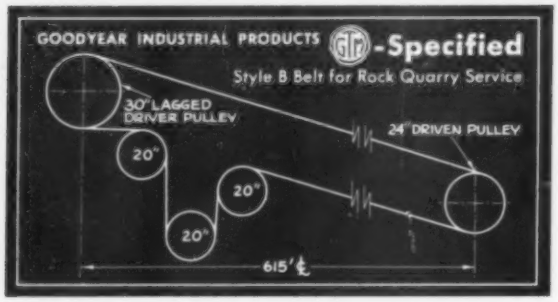

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